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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 5] [1924

XXI.—REVISION OF THE GENUS SPHAERANTHUS.

W. Robyns.*

The present revision of the genus *Sphaeranthus* (*Compositae*) is mainly based upon the specimens belonging to the herbaria of the Royal Botanic Gardens, Kew, of the Natural History Museum, South Kensington, and of Brussels. The rich collections of these institutions contain representatives of nearly all the species here dealt with. The author wishes to express his thanks to the Directors of these institutions, and particularly to the Director of the Royal Botanic Gardens, Kew, for the many facilities afforded to him. He is especially indebted to Mr. J. Hutchinson, Assistant in the Herbarium, Kew, whose valuable help and most kind advice he was able to appreciate fully during his short stay at Kew.

Historical.—The genus *Sphaeranthus* was founded by Vaillant in 1719 ([1]). In 1753, Linnaeus ([2]) described *S. indicus*, which is the oldest and best known species. De Candolle, in his Prodromus (1836) ([3]), subdivided the genus into three sections. Sect. I. *Eusphaeranthus*: compound heads with solid main axis; bracts all linear, soft, nearly as long as the partial heads, the outer ones scarcely forming a general involucre; Indian species. Sect. II. *Cuspidella*: common receptacle nearly solid or scarcely hollow; bracts spiny mucronate, the outer scales forming a distinct common involucre, the others scarcely longer than the partial heads; African species. Sect. III. *Polycephalos*: common receptacle generally hollow; bracts all ovate-lanceolate, cuspidate, firm, longer than the partial heads, the outer ones hardly or not forming a general involucre; India, Africa and Australasia. Steetz (1862–4) ([4]) in a revision of *Sphaeranthus*, and following the descriptions of Robert Wight (1846) ([5]), divided the genus into two: *Sphaeranthus* and *Oligolepis* Wight. He subdivided *Sphaeranthus* into two

* Dr. Walter Robyns, of the University of Louvain, Belgium, spent some months at Kew during last summer, and besides assisting in the naming of African collections prepared this revision of the Composite genus *Sphaeranthus*.

18064. Wt. 152–28. 1000. 6/24. Wy. & S., Ltd. Gp. 50. (4).

sections, *Eusphaeranthus* and *Polylepis*. According to Steetz the genus *Oligolepis* differed mainly from *Sphaeranthus* and especially from *Eusphaeranthus* by the partial heads being closely pressed together and hidden amongst the bracts of the common receptacle, by the asymmetrical involucre, the scales distinctly longitudinally folded, embracing the female flower, the others boat-shaped or flat; male flower always solitary; peduncles always shorter than the compound heads. Steetz only enumerated 7 species known to him, four of *Sphaeranthus* and three of *Oligolepis*, with three not seen by him and two dubious species. Oliver (1877) ([6]) gave descriptions of seven species occurring in Tropical Africa, and united *Oligolepis* with *Sphaeranthus*. Hoffmann (1894) ([7]) divided the sixteen African species known to him into two sections as follows:—I. *Multiflori*; partial heads with 7 or more bracts and numerous female flowers. II. *Pauciflori*; partial heads with 2–4 or sometimes 6 bracts, and up to 6 female flowers. To this arrangement Muschler (1911) ([8]) enumerated eight additional species.

The present revision has been undertaken on account of the confusion still existing in regard to the synonymy of the older species, and because of the difficulty attending the determination of additional material. The classification here adopted has been established after careful dissections of nearly all the species, which combined with the external characters seem to give a true phylogenetic arrangement. The number of species has now increased to thirty-eight, of which nine are described here for the first time.

Emended description of the genus *Sphaeranthus*.

Herbae erectae vel rarissime procumbentes, interdum suffrutescentes, in locis humidis vel exsiccatis crescunt, glabrae et etiam glanduloso-punctatae, hirsutae vel villosae; caules simplices vel plerumque ramosi, cum pedunculis alati vel rare exalati, alis integris vel laceratis; folia alterna, sessilia, in caulem decurrentia, integra vel leviter dentata. *Capitulorum glomeruli* terminales, rarissime axillares vel caulis basin versus dispositi (*S. epigaeus*), saepe numerosi et pedunculati, ovoidei vel depresso-globosi (*Pseudosphaeranthus*) et bracteis exterioribus involucrati, cylindrici vel globosi (*Eusphaeranthus*) et exinvolucrati; receptaculum commune plerumque ambitu glomerulorum conformatum nudum vel rugosum; bracteae involucri vel subtendentes semper mucronatae vel acuminato-apiculatae, rigidae. *Capitulorum squamae* 3–14, plerumque circiter 4–10, plus minusve membranaceae et saepe ciliatae; capitula propria semper sessilia, heterogama, disciformia, floribus exterioribus ♀ interioribus ♂, receptaculo nudo. *Flores* ♀ 2–35, interdum stipitati; corolla tenuiter tubulosa, minute 2–4-dentata, interdum basi incrassata; stylus apice bifidus, glaber. *Flores* ♂ 1–7, plerumque 1–2, saepe sessiles; corolla tubulosa, saepe crassa et spongiosa, in limbum

5-dentatum expansa ; antherae basi sagittatae ; stylus plerumque divisus, papillosus. Achaenia fertilia plerumque angularia, saepe glandulosa.

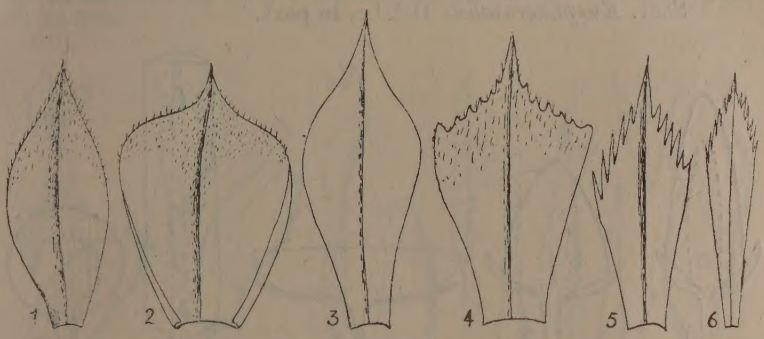

Fig. I. Forms of bracts in *Sphaeranthus* : outer subtending bracts of 1, *S. cyathuloides*. 2, *S. Johnstonii*. 3, *S. amaranthoides*. 4, *S. suaveolens*. Bracts of separate heads of 5, *S. ukambensis*. 6, *S. humilis*.

Subdivision and affinities of the genus.

In subdividing the genus into the following groups I have used mainly such characters as seemed to be constant and which might be regarded as of phylogenetic importance. Such are (1) the shape of the compound heads, (2) the nature of the subtending bracts, (3) the degree of reduction in the number of flowers in the partial heads, (4) the presence or absence of a rudimentary pappus, with other characters of less importance (stems winged or not, indumentum, leaf-shape, etc.).

In this way the following groups have been established.

Subgenus I. **Pseudosphaeranthus** ; compound heads ovoid or depressed-globose ; outer bracts forming a distinct common involucre ; partial heads with about 4 (rarely up to 10) bracts, one of which subtends each head and is larger than the others and mucronate. (See Fig. II., 1–3.)

Section 1. Oocephalae ; compound heads ovoid, ovoid-elongated or ovoid-globose ; common receptacle always hollow inside.—Sect. *Cuspidella* DC. Prodr. 5 : 370 in part ; Sect. *Polycephalos* DC. l.c. in part.

Section 2. Platycephalae ; compound heads depressed-globose, in cross section flat on top or nearly so.

Subgenus II. **Eusphaeranthus** ; compound heads cylindric, oblong or globose ; no common involucre of bracts present ; partial heads with about 10 bracts all more or less of the same size and shape.—DC. Prodr. 5 : 369 as section, in part. (See Fig. II., 4–5.)

Section 3. Cylindrocephalae ; compound heads cylindric or oblong, longer than broad, the common axis elongated.—Sect. *Eusphaeranthus* DC. l.c. in part ; Sect. *Polycephalos* DC. l.c. in part.

Section 4. SPHAEROCEPHALAE ; compound heads spherical-globose, in cross section showing a similar hollow rounded common receptacle.—Sect. *Cuspidella* DC. in part ; Sect. *Eusphaeranthus* DC. l.c. in part.

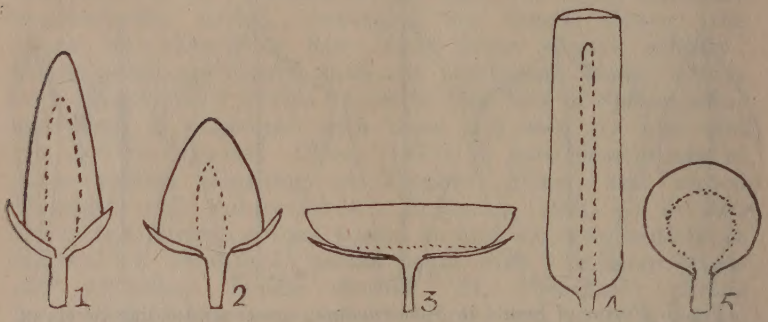

Fig. II. Diagrams showing shapes of compound heads of the four sections of *Sphaeranthus* : 1 and 2, Section *Oocephalae*. 3, *Platycephalae*. 4, *Cylindrocephalae*. 5, *Sphaerocephalae*.

In this genus *Sphaeranthus*, which is highly specialised on account of its compound heads, one might expect to find some evidence of descent from allied and more primitive genera ; and in endeavouring to trace this evidence one would naturally select a group in which the heads are more or less elongated or ovoid, suggesting descent from ancestors with either spicate or closely corymbose flower heads. In this respect I find two distinct types of compound heads which have probably been evolved on similar lines : the one represented by the subgenus *Pseudosphaeranthus* having its most primitive species represented in the section *Oocephalae* by *S. cyathuloides* and *S. Johnstonii*, which have not only the ovoid compound heads, but also the rudiments of a pappus, besides stipitate female flowers. It is significant, too, that this group is also common to both East Africa and India, suggesting a closer connection between these two regions in the past. The depressed-globose section *Platycephalae* is evidently only a further specialisation of the *Oocephalae* group. The second type, *Eusphaeranthus*, finds its most primitive species in section *Cylindrocephalae*, especially in *S. ukambensis*, which has an elongated spike-like inflorescence. The further reduction of this group gives us the *Sphaerocephalae*, which appears to be the more recently evolved, and includes some of the most widely spread species of the genus, i.e. *S. africanus*, *S. indicus* and *S. senegalensis*.

I am quite unable to point out a genus which would suggest itself as a primitive representative of the subgenus *Pseudosphaeranthus* ; but it is otherwise with the subgenus *Eusphaeranthus*, which may be closely connected with *Pterocaulon* Ell. There seems to be considerable affinity between the Indian *Pterocaulon cylindrostachyum* Clarke, and the East

African *Sphaeranthus ukambensis*, the pappus being the major feature separating them, whilst the Australian *Pterocaulon sphaeranthoides* greatly resembles *Sphaeranthus variabilis* and *S. indicus*.

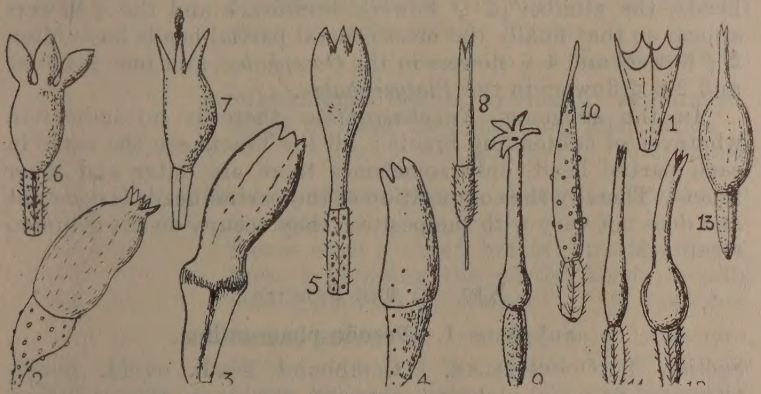

Fig. III. 1. Ovary and rudimentary pappus of *S. cyathuloides*. 2-7, some forms of hermaphrodite flowers: 2, *S. strobuliferus*. 3, *S. keniensis*. 4, *S. Steetzii*. 5, *S. Talbotii*. 6, *S. sphenocleoides*. 7, *S. indicus*. 8-13, some forms of female flowers: 8, *S. cyathuloides*. 9, *S. angustifolius*. 10, *S. epigaeus*. 11, *S. variabilis*. 12, *S. angolensis*. 13, *S. africanus*.

Composition of the Flower Heads.

The compound heads (glomerules) are always made up of a large number of sessile partial heads. In these partial heads a certain number of bracts form a protecting involucre and inside the bracts a certain number of female flowers generally surround a few hermaphrodite flowers, the latter occupying constantly the central portion of the heads.

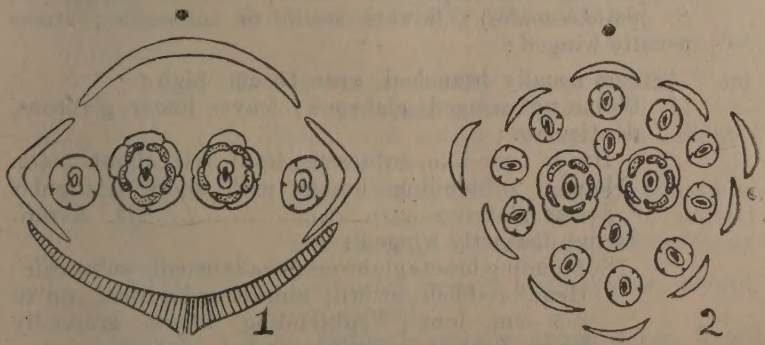

Fig. IV. 1, Diagram showing ground plan of *Pseudosphaeranthus*. 2, that of *Eusphaeranthus*.

In the subgenus *Pseudosphaeranthus* each partial head is provided with a subtending outer bract and generally with an adaxial inner bract and two lateral bracts, which are more

or less longitudinally folded. The number of flowers in each partial head is often variable according to the position they occupy. The outer heads have sometimes only ♀ flowers without ♂ flowers, but towards the top or the centre of the compound heads, the number of ♀ flowers diminishes and the ♂ flowers appear so that finally the most central partial heads have often 2 ♂ flowers and 4 ♀ flowers in the *Oocephalae*, and one ♀ flower and 2-6 ♂ flowers in the *Platycephalae*.

In the subgenus *Eusphaeranthus* there is no indication whatever of subtending bracts ; all the bracts are the same in each partial head, only sometimes there are outer and inner bracts. Thereby the composition of the partial heads is constant and does not vary with the position they occupy on the common receptacle.

Key to the Species.

Subgenus I.—**Pseudosphaeranthus.**

Section I. Oocephalae. Compound heads ovoid, ovoid-elongated or ovoid-globose ; common receptacle always hollow inside.

* Compound heads terminal, not towards the base of the stem :

Pappus developed in the ♂ flowers ; ♀ flowers stipitate ; stems not or only slightly winged :

Subtending bracts of the partial heads in about 20 series, gradually acutely acuminate, not membranous on the margins .....1. *cyathuloides.*

Subtending bracts of the partial heads in about 10 series, rather abruptly acuminate, the margins more or less membranous .....2. *Johnstonii.*

Pappus not developed in the ♂ flowers (except in *S. gomphrenoides*) ; flowers sessile or subsessile ; stems usually winged :

†Stems usually branched, over 15 cm. high :

Stems not winged, glabrous ; leaves linear, glabrous, denticulate :

Heads cone-like, subsessile, hard, red, about 2 cm. long ; subtending bracts with short triangular points, glabrous .....3. *Kirkii.*

Stems distinctly winged :

‡Subtending bracts glabrous ; heads usually subsessile :

Heads reddish brown, almost cylindrical, up to 2·5 cm. long ; subtending bracts gradually long-acuminate ; ovary rounded, glabrous ..... 4. *amaranthoides.*

Heads stramineous, broadly ovoid, less than 1·5 cm. long ; subtending bracts gradually long-acuminate ; ovary angular ..... 5. *zeylanicus.*

Heads reddish, ovoid, about 1·5 cm. long; subtending bracts broad, usually abruptly and shortly mucronate:

Heads subsessile; ♀ flower cylindric:

Subtending bracts very abruptly acuminate; wings of stem broad; Persia ..... 6. *strobuliferus.*

Subtending bracts gradually acuminate; wings of stem very narrow; East Africa ..... 7. *cristatus.*

Heads pedunculate; ♀ flower contracted at the base:

Stems erect; outer bracts broadly ovate, those subtending the partial heads broadly oblong-obovate mucronate ... 8. *keniensis.*

Stems prostrate; outer bracts lanceolate, those subtending the partial heads broadly linear, long-apiculate..... 9. *gomphrenoides.*

‡‡Subtending bracts hairy, scabrid or glandular; heads stalked:

Heads oblong-ovoid, about 2 cm. long; subtending bracts long-acuminate, hirsute, ciliate; Burma ..... 10. *peguensis.*

Heads globose-ovoid, usually much less than 2 cm. long; subtending bracts usually shortly acuminate:

§Leaves glabrescent:

Leaves usually about 2 cm. broad, oblong or linear-oblong, distinctly toothed; peduncle short, conspicuously winged, thick ..... 11. *suaveolens.*

Leaves linear, usually not more than 1 cm. broad; peduncle rather slender:

Wings of stem entire or slightly denticulate:

Peduncles glabrous, usually conspicuously winged; stems simple or slightly branched, glabrescent 12. *angustifolius.*

Peduncles more or less hairy or scabrid, not winged:

Peduncle usually about 4 cm. long; subtending bracts shortly mucronate, the outer ones not conspicuous; South Africa ..... 13. *pedunculariis.*

Peduncle not more than 1·5 cm. long; subtending bracts quite distinctly

apiculate or aristate, the outer ones very conspicuous :

Subtending bracts glabrescent ; ♂ corolla not contracted at the base ; East Africa ..... 14. *Steetzii.*

Subtending bracts glabrescent ; ♂ corolla contracted in the lower part ; West Africa ..... 15. *Talbotii.*

Wings of stem incised ; stems much-branched, hairy or glandular ..... 16. *incisus.*

§§Leaves rather densely pubescent ; heads about 4 mm. in diameter ; subtending bracts very small ; ♂ flowers 4–5 ; ♀ flowers 8–5 ; Madagascar ..... 17. *cotuloides.*

††Stems simple, not winged, up to 9 cm. high ; leaves oblanceolate, acute, villous, subentire ; heads very shortly stalked ; ♂ flowers 3–4, ♀ flowers about 9 ..... 18. *calcareus.*

**Compound heads lateral :

Compound heads axillary in the upper leaves, solitary or glomerate ; stems winged ..... 19. *Stuhlmannii.*

Compound heads inserted singly near the ground at the base of the shoots, subsessile ; ♂ flower 1, ♀ flowers 6–8 in each partial head ..... 20. *epigaeus.*

Section II. Platycephalae. Compound heads depressed-globose, the inner section showing the depression quite well.

Wings of stem entire or very slightly toothed :

Stems and leaves nearly glabrous ; ovary and corolla nearly glabrous ; Northern Nigeria ..... 21. *Lelyi.*

Stems and leaves hairy ; ovary and corolla very glandular ; East Africa ..... 22. *nubicus.*

Wings of stem coarsely toothed or jagged :

Peduncles not winged, thinly pubescent, terminal and lateral ; North East Africa :

Partial heads numerous with 6–8 bracts ; ♀ flowers 6 ..... 23. *neglectus.*

Partial heads rather few with 3 bracts ; ♀ flowers 2 ..... 24. *Fischeri.*

Peduncles not winged, villous-pubescent, terminal ; leaves up to 6 cm. long and nearly 2 cm. broad ; Rhodesia ..... 25. *Rogersii.*

Peduncles winged, villous, terminal and lateral ; leaves up to 1 cm. long and less than 5 mm. broad ; Madagascar ..... 26. *madagascariensis.*

Subgenus II.—**Eusphaeranthus.**

Section III. CYLINDROCEPHALAE. Compound heads cylindric or oblong, common axis elongated.

Compound heads elongated, cylindric, up to 4·5 cm. long and 6 mm. broad; partial heads numerous; peduncle not winged but ribbed ..... 27. *ukambensis.*

Compound heads oblong to broadly ellipsoid; partial heads usually less numerous and large, peduncle winged:

Wings of the stem denticulate or jagged; plant more or less tomentose; heads up to 1·3 cm. long; ♀ flowers 8 ..... 28. *variabilis.*

Wings of the stem entire; plant quite glabrous; heads about 1 cm. long; ♀ flowers 20–35; Zanzibar ..... 29. *sphenocleoides.*

Section IV. SPHAEROCEPHALAE. Compound heads spherical-globose, inner section showing a similar hollow rounded common receptacle.

Plants glabrescent or puberulous; partial heads large with 20–30 ♀ flowers; wings of stem entire or slightly denticulate:

Plants densely puberulous; leaves about 1 cm. long, thick; ♂ flowers 5, ♀ flowers about 30 in each partial head ..... 30. *confertifolius.*

Plants glabrous or glabrescent; leaves about 4–7 cm. long, thin; ♂ flowers 2–3, ♀ flowers 20–22 in each partial head ..... 31. *africanus.*

Plants more or less hairy; partial heads small with few (rarely up to 16) ♀ flowers; wings of stem coarsely toothed or jagged, sometimes absent:

*♀ Flowers about 9–16; peduncle of central flower head usually conspicuously winged:

Stems winged:

Heads usually numerous and small, about 7–8 mm. in diameter; stem and leaves pubescent; ♀ flowers about 16 ..... 32. *angolensis.*

Heads rather few, usually more than 1 cm. in diameter:

Stem and leaves pilose; ♀ flowers 12–16 ..... 33. *indicus.*

Stem and leaves rather densely and softly lanate; ♀ flowers about 9..... 34. *senegalensis.*

Stems not winged, about 30 cm. high; peduncles up to 1·5 cm. long:

Stems prostrate, flexuose; heads axillary; ♂ flowers 2 in each partial head; Congo ..... 35. *flexuosus.*

Stems erect, not flexuose; heads terminal and lateral; ♂ flowers 3 in each partial head; Eastern Sudan ..... 36. *Brounae.*

** ♀ Flowers about 4–5 ; peduncle of central flower head not winged :

Plants dwarf and slightly branched, with few heads about 1 cm. in diameter ; peduncle up to 6 cm. long ; Angola, Zambesi basin ..... 37. *humilis*.

Plants tall and much branched, with very numerous small heads about 6 mm. in diameter ; peduncle up to 1·5 cm. long ; Tanganyika Territory ..... 38. *polycephalus*.

Subgenus I. **Pseudosphaeranthus.**

Section I.—Oocephalae.

1. **S. cyathuloides** *O. Hoffm.* in Engl. Bot. Jahrb. 20 : 229 (1894). Bracts of partial head 4 : ♂ flowers 2, sessile ; pappus rudimentary ; corolla large, contracted immediately below the 5 teeth : ♀ flowers 4, stipitate ; ovary angular, hairy ; corolla small.

Tropical Africa : Kenya Colony : Ukamba near Adi River and N'deo, in moist places, March 1877, *Hildebrandt* 2611 (type). Near Nairobi, *Miss M. J. Johnstone* 152 !

2. **Sphaeranthus Johnstonii** *Robyns* sp. nov. ; affinis *S. cyathuloidei* O. Hoffm., sed capitulorum bracteis subtendentibus paucioribus circiter 10-seriatis abrupte acuminatis marginibus plus minusve membranaceis differt.

Herba annua parce ramosa, ramulis glabris erectis plerumque exalatis, *Folia* sessilia, lineari-lanceolata, apice saepe acuminata, basi leviter cordata, amplexicaulia, usque ad 6 cm. longa et 0·5 cm. lata, nervis adscendentibus marginibus denticulatis, glabra. *Glomeruli* ovoidei vel ovoideo-elongati, apice saepe acuti, breviter pedunculati, pedunculo saepe incrassato exalato, usque ad 1·5 cm. longi et circiter 0·8 mm. lati. *Capitulorum bracteae* subtendentes circiter 10-seriatae, amplissimae, obtusae, abrupte acuminatae, marginibus plus minusve membranaceis, hirsutae. *Squamae* laterales 2, bracteis subtendentibus angustiores. *Flores* ♂ 2, corolla crassa sub limbi dentibus ciliatis constricta, pappo valde rudimentario ; flores ♀ 4, stipitati, cum ovario angulato hirsuto.

Tropical Africa. Kenya Colony : Baringo, at about 1100 m., buds mauve, leaves dark green, March 1901, *H. H. Johnston* (type) ! Near Mariakani at about 220 m., *Kassner* 450 ! Witu, *Thomas* 125 ! Ukambani ; Kibwesi station, herb 30–50 cm. high, in sunny grassy places with red clayey soil, *Scheffler* 73 ! Nairobi ; Attii plains, at about 1800 m., *Dummer* 1941 ! *Whyte* ! Ngomeni, plant with strong scent and purple flowers, *Scott Elliot* 6262 ! Tanganyika Territory : in the lower half of Madschame, 1000 m., Jan. 1894, *Volkens* 1631 ! Dar es Salaam, *Stuhlmann* 7889 !

3. **S. Kirkii** *Oliv. et Hiern* in Fl. Trop. Afr. 3 : 333 (1877).

Subtending bracts large, obtuse, with short mucro, glabrous ; adaxial bracts very small : ♂ flowers 2 ; ovary angular without pappus, glabrous, with sessile glands on the enlarged upper margins : ♀ flowers 4, subsessile.

Tropical Africa. Tanganyika Territory : Bagamayo, Oct. 1867, *Kirk* (type) !

4. **S. amaranthoides** *Burm.* Fl. Ind. 186 (1768) ; Hook. f. Fl. Brit. Ind. 3 : 274, partim.

Oligolepis amaranthoides Wight in Calc. Journ. Nat. Hist. 7 : 161 ; Ic. Pl. t. 1145.

Subtending bracts mucronate, glabrous ; adaxial bracts truncate, with small teeth at the upper end : ♂ flowers 2, corolla small ; ovary round, with upper empty part quite glabrous : ♀ flowers 4, stipitate ; ovary hairy.

India. Madras : Coimbatore, without locality, September 1890, *Wight* 1553 ! *Hooker and Thomson* 131 ! Anamalay, July 1848, *Wight* 1553 !

Ceylon. *Thwaites* 1768 !

5. **S. zeylanicus** *Heyne* in Wall. Cat. 3180, *nomen* ; affinis *S. amaranthoidei* Burm., sed glomerulis stramineis ovoideis brevioribusque et numero ♂ florum in capitulis valde differt.

Herba annua, probabiliter tantum usque ad 30 cm. alta, ramulis erectis rotundatis semper alatis glabris. *Folia* sessilia, in alis integerrimis decurrentia, apice obtusa, rotundata, leviter mucronata, basi angustiora, usque ad 7 cm. longa et 1·5 cm. lata, minute denticulata, glabra. *Glomeruli* pauci, late ovoidei, subsessiles, straminei, vix 1·5 cm. longi. *Bracteae* subtendentes sensim longe acuminatae, scariosae, omnino glabrae ; bracteae adaxiales truncatae, cum mucrone medio breve. *Flos* ♂ 1, sessilis, corolla crassa sub limbi dentibus constricta, ovario rugoso ; ♀ flores 4, sessiles, corolla valde tenue, ovario hirto.

Without locality, but probably from Ceylon, *Wight in Herb. Wallich* 3180B ! *Wight* 1416 (type) !

India. Madras : Coimbatore ; swampy places near Bolampatty, 450m., Dec. 1880, *Beddome* 4389 !

6. **S. strobuliferus** *Boiss. et Noë* in Boiss. Diagn. Ser. ii. 3 : 6 (1856).

Subtending bracts broad, obtuse, long-acuminate, with membranous margins, glabrous : ♂ flowers 2, subsessile ; ovary short, glabrous, with scattered glands ; corolla very broad, contracted in the upper part : ♀ flowers 4, subsessile ; ovary hairy.

Persia. Bagdad, in cultivated fields, *Haussknecht* 1868 ! Muhammareh, *Noë* 329 !

7. **S. cristatus** *O. Hoffm.* in Engl. Bot. Jahrb. 24 : 470 (1898).

Tropical Africa. Tanganyika Territory: Usambara; in the Madunu Swamp, Sept. 1892, *Holst* 3970.

I have not seen a specimen of this species.

8. **Sphaeranthus keniensis** *Robyns* sp. nov.; ex descriptione per affinis *S. gomphrenoidei* O. Hoffm., caulibus erectis, bracteis exterioribus late ovatis, bracteis capitulis subtendentibus late oblongo-obovatis (nec linearibus) mucronatis differt.

Herba annua erecta, valde ramosa, ramulis glabris adscendentibus rotundatis conspicue alatis, alis subintegris. *Folia* lineari-lanceolata, apice mucronata, basi lata, amplexicaulia, decurrentia, nervis lateralibus adscendentibus paucis et vix distinctis, fere 4 cm. et interdum usque ad 8 cm. longa, circiter 0·5-1 cm. lata, denticulata, subglabra. *Glomeruli* numerosi late ovoidei, apice acuti, pedunculati, pedunculo alato usque ad 1·5 cm. longo. *Bracteae* exteriores late ovatae; capitulorum bracteae subtendentes late oblongo-obovatae, omnes mucronatae sub mucrone cum maculo nigrescente, marginibus superioribus leviter denticulatae, marginibus lateralibus membranaceis, subglabrae. *Flores* ♀ 2, sessiles, cum ovario magno angulare glabri; corolla magna, ovario circiter aequilonga, basi conpicue constricta, glabra et interdum leviter glandulosa. *Flores* ♀ 4, subsessiles, ovario hirto.

Tropical Africa. Kenya Colony: Kibose, 1906, *Powell* (type)! Without locality, *C. F. Elliott* 382! Near lake edge, Kisumu, about 1200m., Febr. 1915, *Dummer* 1778! Uganda, 6th day from Mumias, 1898, *Whyte* 131!

9. **S. gomphrenoides** *O. Hoffm.* in Engl. Bot. Jahrb. 20: 229 (1895).

Tropical Africa. Kenya Colony: without locality, *Fischer* 335.

I have not seen a specimen of this species.

10. **S. peguensis** *C. B. Clarke*, Comp. Ind. 97 (1876).

Subtending bracts elongated, gradually long-acuminate, long-ciliate: ♀ flower 1, sessile; ovary small, hairy; corolla narrow in the lower part, broader above: ♀ flowers 4–5, subsessile; ovary ciliate.

Burma. Pegu, *Kurz* 2259 (type)! Prome, *Kurz in Herb. Hance* 18691!

11. **S. suaveolens** *DC.* Prodr. 5: 370; Lam. Ill. Fl. 718 fig 2.

S. indicus Gaertn. Fruct. 2: 413, t. 164. f. 5; Willd. Sp. Pl. 3: pars. iii, 2394, non Linn. *S. abyssinicus* Steetz in Peters Mossamb. Bot. 411. *S. angustifolius* Sch. Bip. in Kotschy, Hb. Nub. no. 463.

Partial heads short and large; scales 6, subtending scale oblong-lanceolate, mucronate, ciliate and rugose on the back side: ♀ flowers 3–4, sessile, corolla spongy, large; ovary

angular, glabrous with scattered glands: ♀ flowers 9–10, sessile, corolla glabrous, constricted at the op, 2-toothed; ovary angular, hairy.

Egypt. Piosette near the Nile, Mitkamr etc. (1820–1826), *Ehrenberg*! Damiatte, *Sieber*! Lower Egypt, *Aucher* 3246! Near springs and streams, Alexandria near Kefed Douar, Dec. 1876, *Letourneux* 80! Birk et Haggar, ancient Iseum near Mansura, March 1877, *Hurst*! Near Hamoul station, Barari, Dec. 1916, *Walsingham* 109! Zagazug, Febr. 1905, *Muschler*! Suez (?) Dec. 1904, *Muschler*!

Tropical Africa. Egyptian Sudan: about Sennar et Wolet Medine in moist places, March 1839, *Kotschy* 463! Eritrea: Saganeite; Mai Golgol, 2000m., March 1892, *Schweinfurth and Riva* 8511! Sarae; Adi Gana, 1900m., Oct. 1902, *A. Pappi* 59! Abyssinia: Near Adoam, on rivers and in swamps, Nov. 1837, *Schimper* 219! Mettgalo, Addi Abun, at about 2100m., Aug. 1862, *Schimper* 79! Cahira, April 1836, *Schimper* 604! Gondar and vicinity, *R.E. Massey* 5! Zenda, *Steudner* 254! Uganda: Foot-hills of Mount Elgon, about 1600m., marshy land, heads purple, *Small* 1184! Ruchiga, 1700m., Dec. 1903, *Bagshawe* 489! Mpanga Forest, Toro, about 1650m., April 1906, *Bagshawe* 998! Kenya Colony: Londiani, 2300m., damp places, about 45cm. high, *Baker* 354! Limuru, 2300m., herb growing almost in water, 30cm. high, with round heads of purple flowers, June 1918, *Snowden* 572! *Scheffler* 319! Limuru, 2300m., riparian swamps, herb with pink-lilac flowers, Febr. 1915, *Dummer* 1601! Galunka, May 1902, *Kassner* 871! Kukui, June 1902, *Kassner* 991! Nairobi, about 1800m., grassy plain, herb about 50cm. with pink-lilac flowers, Febr. 1915, *Dummer* 1916! Kapte plateau, Masai country, about 2000m., Sept. 1884, *Thomson*! Kikuyu and on road to Eldama Ravine, 1898, *Whyte*! 2nd day's march from Eldama Ravine, 1898, *Whyte*! Tanganyika Territory: Usambara; Kwa Muhesa (?), Aug. 1893, *Holst* 8979! Nyasaland: North Nyasaland, Masuku Plateau, 2000–2200m., July 1876, *Whyte*! Shire, Sept. 1912, *Stewart*!

Abyssinian name: "Chommer".

According to Schimper the natives of Abyssinia make use of this herb for scenting the hair.

12. **S. angustifolius** *DC.* Prodr. 5: 370.

Oligolepis angustifolia Steetz in Peters Mossamb. Bot. 417. *Sphaeranthus Randii* S. Moore in Journ. Bot. 46: 40 (1908). *S. tetraphyllus* S. Moore in Journ. Bot. 54: 254 (1916).

Subtending bracts oblong-lanceolate, mucronate, long-ciliate on the upper margin: ♂ flowers 2, corolla enlarged; ovary small: ♀ flowers 4, subsessile, corolla with 3–4 teeth, slightly enlarged above the ovary; ovary subangular, glabrous glandular.

Tropical Africa. Egyptian Sudan: without locality, 1837, *Kotschy* 500 ! without locality, medicinal waterplant, Dec. 1862, *Speke and Grant* 714 ! Bongoland, near Seriba Ghattas in the water of swamp steppes, flowers rose, Sept. 1869, *Schweinfurth* 2378 ! Niamniamland, swamp east of Flusch River, May 1870, *Schweinfurth* 3748 ! Mittuland, near Kuraggera, Jan. 1870, *Schweinfurth* 2823 ! Uganda: Unyoro district, 1300m., July, 1907, *E. Brown* 408 ! Elgon district, 1905, *E. James* ! Kzadanda, near Magigge, 1300m., swamp edge, plant about 45cm. high, flowers lilac-rose, May 1905, *Dummer* 2475 ! Namanjorgi, 1300m., *Dummer* 2574 ! Victoria Nyanza region, *Maitland* 188 ! Kenya Colony: Nairobi, *Dowson* 327 ! Tanganyika Territory: Msilala, *Hannington* ! Nyasaland: Fwambo, 1890, *Carson* ! without locality, 1895, *Buchanan* 390 ! Angoni district, 1901, *J. M. Purves* 93 ! Plateau near Lake Nyasa, *Thomson* ! Shibisia to Tshinmure, 800–1300m., Sept. 1859, *Kirk* ! without locality, Sept. 1896, *Cameron* 9 ! Rhodesia: N'dola, herb in damp places near side of river, Oct. 1906, *C. E. F. Alien* 358 ! Between Broken Hill zinc mine and Bwana M'cuba copper mine, 1906, *C. E. F. Allen* ! Manico district, Umtali division, Odzani river valley, 1915, *A. J. Teague* 403 ! South Rhodesia; Mazoe district, 1300m., on bank of stream flowing from granite, not very plentiful, flower heads globose, pale purple, Sept. 1906, *Eyles* 405 ! Makoni district, 1500m., herb in slow moving water, flowers dull purple, June 1917, *Eyles* 805 ! Salisbury, July 1898, *Rand* 527 ! Near Salisbury, *O. Craster* 218 ! Near Salisbury, 1915, *O. Craster* ! Marandellao, pre-rain flora, Sept. 1917, *J. A. S. Walters* 2362 ! without locality, *A. Hislop* !

13. **S. peduncularis** *DC.* Prodr. 5 : 370.

S. Dinteri Muschler in Engl. Bot. Jahrb. 46 : 107 (1911) ex parte, fide Volkens in Engl. Bot. Jahrb. 53 : 368 (1915).

Scales of partial heads 5–7; subtending scale oblong-lanceolate, mucronate, ciliate: ♂ flowers 2–3, subsessile, with enlarged corolla: ♀ flowers 4–6, subsessile; ovary glandular.

South Africa. Natal: herbaceous in a valley between Umzinkulu River and Umko Mangi River, 1837, *Drège* (type) ! Port Natal, 1840, *Krauss* 224 ! Inanda, June 1879, *J. M. Wood* 346 ! without locality, *Gerrard* 739 !

14. **S. Steetzii** *Oliv. et Hiern* in Fl. Trop. Afr. 3 : 334 (1877).

S. angustifolius Schimper iter Abyss. Sect. 2 (1842) No. 525 non DC.

Subtending bract broad, obtuse, shortly mucronate, slightly glandular on the outer back side: ♂ flower 1, sessile, corolla large, glabrous; ovary short, glandular: ♀ flowers 4–5, subsessile, corolla slender; ovary hairy.

Tropical Africa. Egyptian Sudan: Senaar, *Kotschy* 224 ! Abyssinia: Near Schire Dschogardi, in abandoned fields, Nov. 1839, *Schimper* 525 ! without locality (1863-1868), *Schimper* 1349 !

15. **S. Talbotii** *S. Moore* in Cat. Talbot Nig. Pl. 56 (1913).

Outer bracts oblong-lanceolate, mucronate, hairy, rugose; subtending bracts of partial heads truncate, slightly mucronate, ciliate: ♂ flower 1, sessile, corolla constricted in the lower part, spongy, glabrous; ovary glandular: ♀ flowers generally 4, stipitate, corolla very slender; ovary glandular and hairy.

Tropical Africa. North Cameroons: Garua to Golombe, 1911, *P. A. Talbot* 1005 (type) !

16. **Sphaeranthus incisus** *Robyns* sp. nov.; affinis *S. angustifolio* DC., sed ramulorum alis incisis atque capillis sparsis totae herbae conspicue differt, accedit quoque *S. pedunculari* sed alis incisis et pedunculo multo breviore differt.

Herba annua, ramosa, pubescens vel glandulosa, ramulis erectis divaricatis conspicue alatis, alis semper profunde incisis, dentibus usque ad 1 mm. longis. *Folia* lineari-lanceolata, apice acuta, plerumque mucronata, basi lata, longe decurrentia, 2–4·5 cm. longa et 3–8 mm. lata, conspicue dentata nervis lateralibus adscendentibus. *Glomeruli* ample ovoideo-globosi, usque ad 8 mm. longi, basi usque ad 1 cm. lati, pedunculati, pedunculis primariis glomeruli saepe alatis, caeteris pedunculis exalatis, usque ad 2 cm. longis, pubescentibus. *Capitulorum bracteae* 5–6; bracteae subtendentes oblongo-lanceolatae, sensim acuminatae, ciliatae et rugosae. *Flores* ♂ 0–2; corolla ampla, interdum superne tenuiter glandulosa, ovario glabro. *Flores* ♀ 4–6, subsessiles, corolla glabra, ovario tenuiter glanduloso et piloso.—*S. neglectus* R. E. Fries in Wiss. Ergeb. Schwed. Rhod.-Kongo Exped. 1: 334 (1916) partim.

Tropical Africa. Angola: near Chihinde, S. Angola, 1250m., Sept. 1899, *Baum* 44 (type) !

South Africa. Transvaal: Komati Poort, Oct. 1901, *J. W. C. Kirk* 80 ! Lydenburg, between Spitzkop and the Komati river, Aug. 1884, *Wilms* 867 ! Crocodile river near Louw's Creek, about 300m., Sept. 1886, *Bolus* 1175 ! Swaziland: without locality, *M. M. Stewart* 18 !

17. **S. cotuloides** *DC.* Prodr. 5: 371 (1836).

Scales of partial heads 5–6; subtending bracts oblong-lanceolate, mucronate, very hairy: ♂ flowers 4–5, sessile, corolla with scattered glands on the base and on the top; ovary slender, glabrous: ♀ flowers 8–5, sessile, corolla slender; ovary angular, slightly hairy.

Madagascar. Bombatooke, Mazangay, in moist places, *Bojer* (type) !

18. **Sphaeranthus calcareus** *Robyns* sp. nov.; habitu nana caulibus simplicibus monocephalis, capitulis late ovoideis breviter pedunculatis valde distincta.

Herba annua, erecta, conspicue villosa; caules simplices exalati, usque ad 9 cm. alti basin versus rubescentes. *Folia* sessilia, fere imbricata, lanceolata, apice acuta et mucronata, basi tenuiter constricta, subamplexicaulia, 12–14 cm. longa et circiter 3 mm. lata, subintegra, dense villosa. *Glomeruli* parvi, terminales, solitarii, late ovoidei, usque ad 6 mm. longi, breviter pedunculati, pedunculo exalato circiter 5 mm. longo. *Capitulorum* squamae numerosae, circiter 10; bracteae exteriores lineares, breviter mucronatae, dense ciliatae. *Flores* ♂ 3–4, corolla ampla, glabra, apice cum glandulis sessilibus, stylo indiviso piloso; flores ♀ 9, sessiles, corolla gracile 2-dentata, ovario breve paene glabro.

Tropical Africa. Angola: Huilla-Humpata; Omaramba, in dry places, in chalk ground amongst the stones, common, July 1883, *Newton in Herb. Johnson* (type)!

19. **S. Stuhlmannii** *O. Hoffm.* in Engl. Bot. Jahrb 20: 230 (1894).

Tropical Africa. Tanganyika Territory: Mamgasai, Unjanguiri (Njanguira), July 1890, *Stuhlmann*.

I have not seen a specimen of this species, but from Hoffman's description it is quite distinct from all others by the position of the compound heads; they are axillary in the upper leaves, solitary or glomerate.

20. **S. epigaeus** *Schinz* in Bull. Herb. Boiss. 6: 560 (1898).

Scales of partial heads 4: subtending bracts broadly obtuse, shortly mucronate, glabrous: ♂ flowers 1, corolla large, spongy, with scattered sessile glands; ovary long, about ⅔ the length of the corolla, glandular: ♀ flowers 6–8, sessile, corolla large, ending in a narrow ligula, glandular; ovary hairy.

Tropical Africa. Damaraland: Amboland; Ombalambuenga, 1897, *M. Rautanen* 196 (type)!

Section II. Platycephalae.

21. **Sphaeranthus Lelyi** *Robyns* sp. nov.; affinis *S. nubico* Sch. Bip., sed caulibus foliisque glabris et capitulorum floribus ♂ et ♀ fere eglandulosis conspicue differt.

Herba annua, erecta, parce divaricato-ramosa, usque ad 40 cm. alta; ramuli tenues, conspicue alati, alis integerrimis, glabris. *Folia* sessilia, lineari-lanceolata, apice breviter rigide mucronata, basi ampla, conspicue et longe decurrentia, 3·5–5 cm. longa et circiter 5 mm. lata, integra, nervis lateralibus paucis, vix distinctis adscendentibus; folia caulina inferiora et media subglabra, summa tenuiter glabriuscula. *Glomeruli* terminales et laterales, cum receptaculo commune omnino

plano, late depresso-globosi, 8 mm. lati et circiter 5 mm. alti, pedunculati ; glomerulorum mediorum pedunculus plerumque alatus, caeterum glomerulorum exalatus, 6–12 mm. longus, tenuiter hirsutus. *Paleae* exteriores late obovatae, breviter mucronatae, valde hirsutae. *Capitulorum* squamae 4 ; bracteae subtendentes angustiores plus minusve truncatae, brevissime mucronulatae et tenuiter ciliatae. *Flos* ♂ 1, sessilis, corolla ampla, glabra, interdum tenuiter glandulosa, ovario breve tenuiter piloso: *Flores* ♀ 2–6, subsessiles, corolla gracile 3-dentata, basi leviter glandulosa, ovario breve tenuiter piloso et glanduloso.

Tropical Africa. N. Nigeria : Sokoto, *H. V. Lely* 149 (type) ! Hausa name : *Fura fura.*

22. **S. nubicus** *Sch. Bip.* ex Steetz in Peters Mossamb. Bot. 418 (1864) ; Oliv. et Hiern. Fl. Trop. Afr. 3 : 335. *Sprunnera alata* Schultz Bip. in Kotschy Iter Nub. 209, nomen. *Oligolepis sprunnera* Steetz in Peters Mossamb. Bot. 418.

Outer scales of compound heads broadly ovate, abruptly and shortly mucronate, densely hairy ; subtending inner bracts smaller, shortly mucronate and ciliate ; ♂ flower 1, corolla large, ovary long, both with numerous scattered sessile red glands : ♀ flowers generally 2 (2–4), shortly stipitate, corolla slender with 3 teeth, ovary long, hairy, both with numerous scattered red glands.

Tropical Africa. Egyptian Sudan : Cordofan, near Cordofan Hogeli, in dry ponds, Oct. 1839, *Kotschy* 209 (type) ! West border of Cordofan, Gebel Kagia, Sept. 1875, *Pfund* 356 ! N.E. Nigeria ; Kuka, Febr. 1854, *Vogel* 39 !

23. **S. neglectus** *R.E. Fries* in Wiss. Ergeb. Schwed. Rhod.-Kongo Exped. 1 : 334 (1916), emend.

Tropical Africa. Eritrea : around Acrur, 1900 m., March 1892, *Schweinfurth and Riva* 1056 (type) !

I have not seen Fries' var. *lanatus.*

24. **S. Fischeri** *O. Hoffm.* in Engl. Bot. Jahrb. 20 : 230 (1894).

Outer common scales of compound heads ovate, mucronate, rugose. Partial heads few and small ; scales 3, subtending scale truncate and ciliate, no adaxial scale : ♂ flower 1, sessile, corolla large, quite glabrous ; ovary small and glandular : ♀ flowers 2 (sometimes absent in the central partial heads), sessile, corolla slender, 4-toothed, with a few scattered glands ; ovary hairy.

Tropical Africa. Kenya Colony : Massaini, *Fischer* 346 (type) !

25. **S. Rogersii** *N. E. Brown* in Kew Bull. 1921 : 295.

Outer scales of compound heads oblong-lanceolate, shortly mucronate, ciliate and rugose. Partial heads : scales 5–6,

subtending scale truncate, not mucronate, ciliate ; ♂ flower sessile, corolla large, spongy ; ovary short, transparent, quite glabrous and without glands : ♀ flowers 4–6, sessile, corolla small, spongy, with 3 teeth ; ovary hairy.

Tropical Africa. North-Western Rhodesia : Mazabuka, 3 July 1920, *F. A. Rogers* 26359 (type) !

Baron 4928 from Central Madagascar may be the same species, but the material is somewhat inadequate to decide the question.

26. **Sphaeranthus madagascariensis** *Robyns* sp. nov. ; affinis *S. Rogersii* N. E. Brown, sed ramis numerosis divaricatis, foliis minoribus, pedunculis conspicue alatis, glomerulis valde majoribus conspicue differt.

Herba annua vel suffruticosa, circiter 30 cm. (vel ultra ?) alta, a basi ramosa. *Ramuli* numerosi, divaricati, rotundati, semper alati, praesertim basi brunnei tenuiter pubescentes. *Folia* parva, lanceolata, apice plus minusve acuta, mucronulata, basi ampla, in alas conspicuas undulato-dentatas longe decurrentia, circiter 1 cm. longa et usque ad 5 mm. lata, utrinque villosa. *Pedunculi* numerosi, terminales et laterales, 1·5–2 cm. longi, conspicue alati, alis undulato-dentatis, tenuiter villosi. *Glomeruli* depresso-globosi, leviter peltati, magni, semper 1 cm. diametro, purpurei. *Paleae* exteriores late obovatae, breviter mucronatae, sed mucrone crasso, nervo medio conspicuo, stramineae, hirsutae. *Capitula* propria circiter 4 mm. longa, exteriora circiter 6-squamata, truncata, interiora circiter 4-squamata. *Bracteae* subtendentes plerumque minutissime mucronatae, ciliatae, apicem versus rubrae. *Flos* ♂ 1 (interdum absens in capitulis exterioribus) sessilis, corolla ampla, glabra, stylo indiviso minute denticulato, ovario breve glaberrimo. *Flores* ♀ in capitulis exterioribus circiter 8, in capitulis mediis 4, subsessiles, corolla tenue 3-dentata ovario leviter angulare subglabro.

Madagascar. North West Madagascar, without locality, *Baron* 5503 (type) !

Subgenus II.—**Eusphaeranthus.**

Section III.—Cylindrocephalae.

27. **S. ukambensis** *Vatke et O. Hoffm.* in Engl. Bot. Jahrb. 20 : 228 (1894).

S. stenostachys Chiov.Result.Sci.Miss.Stefan.-Taoli, Somali Ital. 1 : 102 (1916) ex descriptione.

Scales of partial heads 10–12, small, oblanceolate, shortly acuminate and ciliate : ♂ flowers 2, corolla large, ciliate and glandular ; ovary short and glabrous : ♀ flowers 8–10, sessile, corolla slightly enlarged above the ovary, 2-toothed ; ovary glabrous.

Tropical Africa. Kenya Colony: Ukamba; Adi river, in moist places, March 1877, *Hildebrandt* 2612 (type)! Massai Reserve; Southern Guaso Myero River, *Mrs. Dowson* 727! From N. end of Lake Rudolf to Barco, March 1910, *N. C. Cockburn*! Lake Rudolf, *Capt. M. S. Wellby*! Tanganyika Territory: Irangi, *Fischer* 566!

28. **Sphaeranthus variabilis** *Robyns* sp. nov.; affinis *S. ukambensi* Vatke et O. Hoffm., sed glomerulis oblongis vel late ellipsoideis nec elongatis cylindricis, pedunculis alatis et capitulis propriis paucioribus, conspicue differt.

Herba annua vel suffruticosa valde ramosa, usque ad 50 cm. alta, undique plus minusve tomentosa; ramis conspicue alatis rotundatis. *Folia* sessilia, oblongo-lanceolata, apice obtuso-mucronata, basi amplexicaulia et in alas profunde inciso-dentatas saepe spinulosas longe decurrentia, 1·5–3 cm. longa et usque ad 1 cm. lata semper dentata, dentibus plerumque spinulosis, penninervia, nervis lateralibus leviter adscendentibus plerumque vix distinctis. *Glomeruli* numerosi, variabiles, oblongi usque ad late ellipsoidei, usque ad 1·3 cm. longi et circiter 5-6 mm. diametro, receptaculo commune elongato cavoque, distincte pedunculati; pedunculi usque ad 2 cm. longi, alati, alis inciso-dentatis plerumque etiam spinulosis. *Capitulorum* squamae circiter 13, quarum tres semper exteriores graciles, lineari-lanceolatae, 2 mm. longae, longe apiculatae et conspicue ciliatae; squamae interiores ampliores lineari-lanceolatae, emucronatae et ciliatae. *Flores* ♂ 2–3 pro capitulo, corolla ampla, glabra, interdum sub limbi dentibus tenuiter glandulosa, ovario gracile sterileque. *Flores* ♀ circiter 8, sessiles, corolla gracile, 2-dentata, glabra, ovario fertile tenuiter piloso.

Tropical Africa. Nyasaland: Mpassu, Oct. 1887, *Scott* (type)! Without locality, 1891, *Buchanan* 1027! *Buchanan* 1101! North Rhodesia: Boruma, May–July 1891, *Menyhart* 787! Portuguese East Africa: Shigogo, sand bank, June 1859, *Kirk*! near Senna, July 1859, *Kirk*!

29. **S. sphenocleoides** *Oliv. et Hiern* in Fl. Trop. Afr. 3: 333 (1877).

S. microcephalus Vatke in Oesterr. Bot. Zeitschrift, 1875: 326, non Willd.

Partial heads large and short with 6–8 scales, truncate, emucronate, ciliate; ♂ flowers 1–3, corolla broad, consistent, with spreading large teeth; ovary angular, hairy and slightly glandular: ♀ flowers 20–35, sessile, corolla large, consistent in the lower part, constricted into a slender tube, 3-toothed in the upper part; ovary glandular.

Tropical Africa. Zanzibar Island, in marshy places, Oct. 1873, *Hildebrandt* 1021 (type)!

This species is so closely allied to *S. africanus* that it may be only a form of that species. The broadly ellipsoid heads of

S. sphenocleoides are found in *S. africanus*; see especially Malay Peninsula; Setul, *Ridley* 14904 ! which is probably *S. africanus*.

Section IV.—*Sphaerocephalae.*

30. **Sphaeranthus confertifolius** *Robyns* sp. nov.; affinis *S. africano* Linn., sed ramulis foliisque dense puberulis, foliis multo minoribus confertis et crassis distincte differt.

Suffruticosa, basi lignescens, ramosa, usque ad 30 cm. alta, undique dense puberula; ramuli breves, anguste alati, alis subintegris. *Folia* parva, sessilia, conspicue conferta, oblanceolata, apice subacuta, basi paullo angustiora, in alas decurrentia, circiter 1 cm. longa et 4 mm. lata, subintegra, nervis lateralibus indistinctis, crassa, callosaque. *Glomeruli* pauci, praecipue terminales, spherico-globosi, circiter 8 mm. diametro, pedunculati, pedunculis circiter 5 mm. longis alatis et costatis. *Capitula* propria pauca, amplissima; squamae circiter 13 quarum 3 exteriores sed interioribus leviter dissimiles; omnes obovato-lanceolatae, leviter cucullatae, breviter calloso-mucronulatae (exteriores cum mucrone vix longiore), ciliatae, dorso apicem versus rugosae. *Flores* ♂ 5–7, corolla ampla, apicem versus cum glandulis sessilibus, ovario glabro; flores ♀ circiter 30, sessiles, corolla tenue 3-dentata, glaberrima, ovario angulare glabro.

Tropical Africa. Kenya Colony: Nairobi, at about 1700 m., outskirts of golf-course, about 30 cm. high, flowers lilac-rose, Febr. 1915, *Dummer* 1976 (type) !

31. **S. africanus** *Linn.* Sp. Pl. 1314.

S. africanus et *S. microcephalus* Willd. Sp. Pl. 3: 2395. *S. microcephalus* et *S. glaber* DC. Prodr. 369, 370. *S. indicus* Kurz in Journ. As. Soc. 2: 183 (1877). *S. africanus* Wall. Cat. 3179 A-H. *S. Hildebrandtii* Baker in Journ. Linn. Soc. 25: 326 (1890).

Partial heads large; scales 9 to each separate head, 3 outer scales oblong-lanceolate, mucronate, glabrous, 6 inner scales truncate, shortly mucronate, glabrous: ♂ flowers 2–3, corolla large, consistent, with scattered glands; ovary as long as the corolla, angular, glandular: ♀ flowers about 20-22, sessile, corolla large, contracted in a slender 3-toothed tube in the upper part; ovary glandular.

Distribution.—Recorded from Madagascar (but not yet from Africa proper), India (Ceylon, Madras, Bombay, Bengal, Burma), Siam, Cochin China, Hainan, Malay Peninsula and Archipelago, and N. Australia.

I have not seen a specimen of *S. erectus* Zoll. & Mor. (Nat. en Geneesk. Arch. Voor. Neerl. Ind. 2: 233, 1845) from Java, and from description it may be the same as *S. africanus*, which occurs in Java, and of which specimens from Zollinger's herbarium are at Kew.

32. **S. angolensis** *O. Hoffm.* in Engl. Bot. Jahrb. 20 : 228 (1894).

Scales of partial heads about 10, lanceolate, mucronate and ciliate : ♂ flower 1, sessile, corolla large, long-toothed, glabrous ; ovary very slender ; ♀ flowers 15–17, sessile, corolla bottle-shaped, broadly enlarged above the ovary and finally contracted in a long slender tube, with 3 teeth, glabrous ; ovary angular, hairy.

Tropical Africa. Angola : on the dried-up mud of the lakes along the river Lifune, near Libongo, Aug. 1858, *Welwitsch* 3509 (type) ! *Welwitsch* 3508 ! Belgian Congo : Stanley-pool, about 300 m. in moist places, procumbent, up to 50 cm. high, July 1888, *Hens* 79 ! Bokala, July 1914, *Vanderyst* 4819 ! Around Leopoldville, Aug. 1902, *Gillet* ! Between Leopoldville and Mambagi, 1902, *Gillet* 2523 !

33. **S. indicus** *Linn.* Sp. Pl. 1314.

S. hirtus Willd. Sp. Pl. 3 : 2394 et 2395 ; *S. hirtus* et *S. mollis* DC. Prodr. 5 : 369 ; *S. hirtus* Kurz in Journ. As. Soc. 2 : 283 (1877), et 3179 B.C. ; *S. ovalis* Steetz in Peters Mossamb. Bot. 413 (1863). *S. mossambiquensis* Steetz l.c. 421.

Scales of partial heads about 10, linear-obovate, slightly mucronate, ciliate : ♂ flowers 2–3, corolla large, consistent in the lower half, constricted below the 5 teeth, style undivided ; ovary angular, glabrous : ♀ flowers 12–16, subsessile, corolla enlarged above the ovary, with 2 teeth, glabrous.

Distribution.—Recorded by numerous specimens from Ceylon, Madras, Bombay (*Ritchie* 410), China (*Henry* 123), Java (*Zollinger* 548), N. Australia, Kenya Colony (*Dummer* 1943, *Dowson* 510, *Whyte*), Delagoa Bay (*Schlechter* 12084), and Madagascar (*Hildebrandt* 3423).

34. **S. senegalensis** *DC.* Prodr. 5 : 370.

S. hirtus Oliv. & Hiern Fl. Trop. Afr. 3 : 334, non Willd. *S. indicus* Hooker Fl. Brit. Ind. 3 : 275, non Linn.

Scales of partial heads about 12, linear-oblong, the outer mucronate, the inner emucronate, all ciliate : ♂ flowers 3–4, subsessile, corolla large, spongy in the lower half, not spongy and glabrous in the upper ; ovary glabrous : ♀ flowers generally 9, sessile, corolla enlarged above the ovary, with 2 teeth, style bifid ; ovary angular, slightly hairy.

Tropical Africa. Cape Verde Peninsula : *Brunner* 113 ! Senegambia : *Heudelot* 771 ! *Roger* ! *Farmer* 130 ! Gambia : *Ozanne* 6 ! *Brown-Lester* 2 ! 8 ! N. Nigeria : Kontagora, *Dalziel* 189 ! N.W. Rhodesia : Mazabuka, *Rogers* 26360 !

India. Numerous specimens from N.W. India, Bengal, Burma, Assam, Siam (*Kerr* 1666, *Vanpruk* 465).

From the rather meagre descriptions, *S. Lecomteanus* O. Hoffm. et Muschler in Bull. Soc. Bot. Fr. 57 : mem. 8 : 114 (1910) ; *S. ovalifolius* Muschler in Engl. Bot. Jahrb. 46 :

107 (1911) and *S. Engleri* Muschler, l.c., 108, appear to belong to this species.

35. **S. flexuosus** O. Hoffm. ex Wildem. in Ann. Mus. Congo, Ser. iv. p.x.

Scales of the partial heads about 18, the outer ones about 9, slender, oblanceolate, acute, constricted in the lower part, broadened above, long-ciliate (fimbriate-plumose) and aristate : ♂ flowers 2: ♀ flowers about 10; ovary hairy; corolla broadened at the base.

Tropical Africa. Belgian Congo : Katanga ; around Lukafu, flowers blue, Oct. 1899, *Verdick* 107 (type) !

36. **Sphaeranthus Brounae** *Robyns* sp. nov. ; affinis *S. senegalensi* DC., sed ramulis pedunculisque exalatis ; foliis integris pilosis, glomerulis minoribus valde differt.

Herba annua, erecta, usque ad 30 cm. alta, ramosa, undique molliter pilosa et obscure glandulosa ; ramuli virescentes, leviter costati exalati. *Folia* sessilia, parva, oblanceolata, apice obtusa et mucronata, basi ampla, cordata et conspicue amplexicaulia, brevissime decurrentia ; folia inferiora usque ad 2 cm. longa, basi usque ad 1 cm. lata, folia superiora circiter 1 cm. longa et 4 mm. lata, omnia integra. *Glomeruli* numerosi, spherico-globosi, circiter 7 mm. diametro, conspicue pedunculati, pedunculis exalatis usque ad 1·5 cm. longis. *Capitulorum* squamae circiter 10, lanceolatae, longe ciliatae, apicem versus tenuiter glandulosae. *Flores* ♂ plerumque 3, sessiles, corolla basi ampla spongiosaque medio tenuiter constricta apice glandulosa, stylo apice leviter bifido, ovario angulare glabro ; flores ♀ circiter 9, sessiles, corolla tubulosa, basi ampla 4-dentata, stylo conspicue bifido, ovario rotundato pilosoque.

Tropical Africa. Egyptian Sudan : Cordofan ; near Agari in dried bed of a pool, herb 30 cm. high, strongly scented, *Mr. and Mrs. A. F. Broun* 845 (type) !

37. **S. humilis** *O. Hoffm.* in Warb. Kunene-Zambesi Exped. 410 (1903).

S. tenuis et *S. setulosus* R. E. Fries in Wiss. Ergeb. Schwed. Rhod.-Kongo Exped. 1 : 333 (1916).

Scales of partial heads 4–9, slender, linear-lanceolate, slightly mucronate and ciliate : ♂ flower 1, corolla large, with pilose lobes, style undivided, hairy; ovary slender, glabrous: ♀ oowers 4–5, corolla slender, glabrous, style slightly divided at the top ; ovary round, glabrous.

Tropical Africa. Angola : between Goudkoppe and Kakele in sandy soil at edge of stream, 1210 m., fl. Oct. 1899, *Baum* 184 (type) ! North Rhodesia : Chibanga, 20 m. N. of River Kafue, 1000 m., in loamy soil, Oct. 1909, *Rogers* 8532 ! Broken Hill, 1300 m., sandy soil, July 1909, *Rogers* 8337 ! Between Broken Hill zinc mine and Bwana M'cuba, aromatic

herb, Oct. 1906, *C. E. F. Allen* 293 ! Bechuanaland : about 1100 m., *Em. Holub* !—The following specimen may belong here : Rhodesia, Tesheke district, *Miss A. E. Gairdner* 134 !

38. **S. polycephalus** *Oliv. et Hiern* in Fl. Trop. Afr. 3 : 333 (1877).

S. hirtus T. Thoms in Speke Journ. App. p. 637, non Willd.

Scales of partial heads 7–10, small, oblanceolate, mucronate and ciliate above : ♂ flower 1, corolla large, glabrous, with a very few glands in the upper part ; ovary angular, slightly hairy : ♀ flowers 3–4, sessile, corolla small, with 3 teeth ; ovary slightly hairy.

Tropical Africa. Tanganyika Territory : Usangara Zungomero, in thick tufts on dried up swamps near rice fields, flowers purple, Oct. 1860, *Speke et Grant* (type) !

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(1) Vaill. in " Act. Gall." 1719 : t. 20, f. 12.
(2) Linn. Sp. Pl. 926 (1753).
(3) DC. Prodr. 5 : 369 (1836).
(4) Steetz in Peters Mossambique Bot. 411 (1862–4).
(5) Wight Ic. Pl. Ind. Or. 3 : t. 1149 (1846).
(6) Oliv. Fl. Trop. Afr. 3 : 332 (1877).
(7) O. Hoffm. in Engl. Bot. Jahrb. 20 : 227 (1895).
(8) Muschler in Engl. Bot. Jahrb. 46 : 105 (1911).

XXII.—NEW ORCHIDS : DECAS L.

The following four species of *Pleurothallis* (Nos. 491–494) flowered at Kew in the late autumn and winter, and all belong to Lindley's section *Macrophyllae fasciculatae* and are of close affinity. They are therefore closely related to *P. linguifera* Lindl., *P. cardiothallis* Reichb., *P. cardiostola* Reichb. and *P. tridentata* Klotzsch. The last is, however, considerably smaller, both in leaf and in flower.

491. **Pleurothallis cardiocrepis** *Braid* ; affinis *P. linguiferae* Lindl. (§Macrophyllae fasciculatae), sepalis dorsalibus angustioribus, labellis angustioribus ovatisque differt.

Caules secundarii elongati, erecti, monophylli, circiter 16 cm. longi, 1·5 mm. diametro, prope basim paucivaginati. *Folium* carnosum, profunde cordatum, apicem versus leviter attenuatum et tridentatum, dente intermedio cuspidato, 8·5 cm. longum, 3·5–5 cm. latum. *Flores* fasciculati ; pedicelli breves, 5 mm. longi ; ovarium circiter 4 mm. longum. *Sepala* lateralia usque ad apicem cohaerentia, plana, ovata, obtusa, pallide viridia, 6 mm. longa, 5 mm. lata ; sepalum dorsale ligulatum, 6 mm.

ongum, 3 mm. latum, pallide roseum. *Petala* linearia, ovata, acuta, 4 mm. longa, 1 mm. lata, rosea, ad basim ciliata. *Labellum* carnosum, ovatum, obtusum, ciliatum, 3 mm. longum, 2 mm. latum, roseum. *Columna* carnosa, superne dilata.

Habitat unknown.

This plant (No. 40/87) was received in 1887 from Mr. B. S. Williams as *P. tridentata*. It has been known at Kew for a number of years as *P. cardiocrepis*, but no description appears to have been published. It is an exceptionally free flowering plant, and two or three flowers often open on the same leaf together. The flowers are small and of a greenish tint largely suffused with rose. The latter colour predominates on the posterior sepal, petals and lip. There are sparse, indistinct serrations on the dorsal sepal, and fringes on the lip and petals, and the column is green spotted with rose. The venation is very indistinct until the flower is dry.

492. **Pleurothallis carnosa** *Braid*; affinis *P. linguiferae* Lindl. (§Macrophyllae fasciculatae) sed forma sepalorum, petalorum labellorumque differt.

Caules secundarii elongati, erecti, monophylli, circiter 8–9 cm. longi, 2 mm. diametro, prope basim parum vaginati. *Folium* carnosum, oblongo-cordatum, demum obtusum, cuspidatum, 7–8 cm. longum, 2–3·5 cm. latum. *Flores* ex folia fasciculati; pedicelli abbreviati; ovarium circiter 3 mm. longum. *Sepala* lateralia fere usque ad apicem cohaerentia, ovato-lanceolata, bifida, 10 mm. longa, 4 mm. lata; sepalum dorsale lanceolatum, acutum, 10 mm. longum, 1 mm. latum. *Petala* lineari-lanceolata, obtusa, 6 mm. longa, 1 mm. lata. *Labellum* carnosum, oblongo-ellipticum, obtusum, subtiliter tuberculatum, 6 mm. longum, 3 mm. latum. *Columna* carnosa.

Habitat unknown.

The history is not known. It has been cultivated for many years at Kew.

The leaves are of a brownish-green colour when young, but later become reddish-green. This may be due to cultural conditions. The flower itself is of a reddish-brown colour with a dull red lip. At Kew this orchid flowers in the late autumn and winter, and when the light is poor the colour fails to develop. The lip possesses one central channel and is minutely tubercled and keeled beneath at the apex. The dorsal sepal is provided with three nerves, the petals with one each and the lateral sepals with two distinct and two obscure nerves. The nervation is distinctive, but barely visible in the living state. The lateral sepals are not completely united, being free for less than 1 mm. at the apex.

493. **Pleurothallis fuscata** *Braid*; affinis *P. linguiferae* Lindl. (§Macrophyllae fasciculatae) sed forma sepalorum labellorumque, nervis sepalorum differt.

Caules secundarii elongati, erecti, monophylli, circiter 22 cm.

longi, 1·5 cm. diametro, viridi-rosei, prope basim parum vaginati; vagina punctata. *Folium* carnosum, cordatum, attenuatum, apice tridentatum, 7 cm. longum, 3·5–4 cm. latum. *Flores* ex foliis fasciculati ; pedicelli abbreviati, circiter 5 mm. longi; ovarium 9 mm. longum. *Sepala* lateralia fere ad apicem cohaerentia, leviter bifida, plana, ovata, obtusa, ciliolata, 12 mm. longa, 7 mm. lata ; sepalum dorsale lanceolatum, acutum, ciliolatum, 12 mm. longum, 6 mm. latum. *Petala* lineari-lanceolata, acuta, ciliata, 7 mm. longa, basi 1 mm. lata. *Labellum* carnosum, tuberculatum, ligulatum, obtusum, subtiliter tuberculatum, ciliatum, infra apicem carinatum, roseum, 6 mm. longum, 4 mm. latum. *Columna* carnosa, dilatata.

Habitat unknown.

The plant (No. 538/85) was received in 1885 from Messrs. Shuttleworth, Carder & Co. Two years later it was figured for the Kew collection of drawings, and although it has flowered freely since it has not been identified or the place of origin discovered.

In colour the flowers are greenish-yellow suffused with red along the veins of the sepals and petals. The sepals are indistinctly ciliated or acutely serrated. The lip is liver coloured and the base is pressed closely against the column and is slightly channelled down the centre, while the apex possesses a slight thickening underneath. Except in the dried state the nerves on the sepals are not very distinct.

494. **Pleurothallis nervosa** *Braid* ; affinis *P. linguiferae* Lindl. (§Macrophyllae fasciculatae), sepalis dorsalibus petalis labellisque angustioribus, forma sepalorum lateralium differt.

Caules secundarii elongati, monophylli, circiter 11 cm. longi, 1–5 cm. diametro, prope basim parum vaginati. *Folium* carnosum, cordato-ovatum, acutum, 7 cm. longum, 2·5 cm. latum. *Flores* ex basibus foliorum fasciculati ; pedicelli abbreviati, circiter 1 cm. longi. *Sepala* lateralia usque ad apicem cohaerentia, plana, ovata, acuminata, obtusa, circiter 10 mm. longa, 5 mm. lata ; sepalum dorsale oblongo-lanceolatum, breviter acuminatum, obtusum, 9 mm. longum, 2 mm. latum. *Petala* linearia, lanceolata, obtusa, 5 mm. longa, circiter 1 mm. lata. *Labellum* carnosum, oblongum, acuminatum, obtusum, roseum, circiter 4 mm. longum, 1·5 mm. latum. *Columna* carnosa.

Central America. Costa Rica : Cachi District ; at 4000 to 5000 feet elevation, *Lankester*.

The plant (No. 516/13) was received from Mr. C. H. Lankester in 1913, but did not flower until December 1923. Vegetatively it agrees very well with *P. fuscata* and the colouring of the flowers is similar, though the details of structure are distinct. The flowers are reddish-greenish-brown with a darker, red lip. When dry five nerves are visible on the posterior sepal and three of these run into the apex, making a slight hood. The petals each possess one vein. The union of the lateral sepals

gives rise to a kite-shaped structure possessing three indistinct nerves about the centre and two more pronounced, one on either side, 7 in all. Frequently the flower fails to develop and remains stunted and of a pale greenish or greenish-brown colour.

495. **Bulbophyllum caesariatum** *Ridley* ; affinis *B. penicillio* Par. & Reichb. f., sed pilis rhachidium florumque et floribus remotis differt.

Pseudobulbus ovoideus, globosus, 13 mm. longus et latus. *Folium* coriaceum oblongum, lanceolatum ad petiolum attenuatum, apice dispariter bilobum, lobo longiore acuto, 15 cm. longum, 2–5 cm. latum ; petiolus 2·5 cm. longus. *Scapus* tenius, 23 cm. longus, nudus praeter bracteas 3 remotas. *Racemus* laxus, pilosus, circiter 25-florus. *Bracteae* lanceolatae, 13 mm. longae, acuminatae, apice setaceo 2·5 mm. longo. *Flores* viridi-albi ; pedicelli crassi, pilosi, 12 mm. longi. *Sepala* ovata, basi gibbosa, pilis longis semi-pellucidis obtecta. *Petala* sepalis dimidio breviora, lanceolata, obtusa, pilosa, 6 mm. lata, pilis apiculata. *Labellum* linearum, oblongum, obtusum, carnosum, probabiliter purpureum, medio canaliculatum, sub labello et margine pilosum. *Columna* glabra, brevis, lata ; alae ovatae cuspido longo.

Indo-China. Lower Siam ; Kopah Jan-Jän, *Mohammed Haniff.*

Allied to *B. penicillium* of Burma, but the flowers and rachis are more hairy and the flowers more distant.

496. **Ione purpurata** *Braid* ; affinis *I. flavescenti* Rolfe, sed sepalis patentibus et colore et magnitudine differt.

Rhizoma repens, subgracile. *Pseudobulbi* subdistantes, ovoidei vel ellipsoideo-ovoidei, 1–2 cm. longi, 1–2 cm. diametro, monophylli. *Folia* angusti-oblonga, subacuta, coriacea, apice subrecurva, circiter 3 cm. longa, 0·5 cm. lata. *Scapi* laterales, breves, circiter 2 cm. alti, 1–2-flori. *Bracteae* ovato-oblongae, subacutae, scariosae, 6–7 mm. longae. *Sepalum* dorsale ovato-oblongum, subacutum apice subrecurvum, 8 mm. longum ; sepala lateralia, subpatentia, lanceolato-ovata, acuta, navicularia, 8 mm. longa. *Petala* patentia, lineari-oblonga, subobtusa, 7 mm. longa, basi latiora et ciliata, apice et margine carnosa. *Labellum* subcarnosum, 6–7 mm. longum, basi suborbiculare subconcavum, apice lineari-oblongum, angustum et subobtusum. *Columna* 2 mm. longa et lata. *Pollinia* 4.

Indo-China. Siam : *Kerr.*

This orchid possesses close affinities in *Ione Andersoni* King et Pantl. and in *Ione flavescens* Rolfe. It is distinguished easily by its size, the spreading sepals and petals and its colour. The lateral sepals are markedly boat-shaped and are slightly connate. The slightly fleshy petals with reddish-purple tips, and the labellum of similar colour, show up clearly against the pale creamy green of the sepals. In the specimen forwarded the

elastic caudicle had contracted and the gland adhered to the column so that the exact position of these could not be determined. It was clear, however, that the arrangement was as in *I. Andersoni* except that it appeared that the two caudicles were distinct and not united. The remains of membranous sheaths adhered to the pseudobulbs and the base of the peduncle. The rhizome was about 2 mm. in diameter.

The orchid flowered in Trinity College Gardens, Dublin, in May, 1923, and was forwarded to Kew for determination by Professor H. H. Dixon. It was collected in Siam by Dr. Arthur Kerr.

497. **Eria Brownei** *Braid* ; affinis *E. alba* Lindl. sed pseudobulbis multo majoribus et planta multo major differt.

Pseudobulbus efoleatus ovoideo-oblongus, erectus pauciarticulatus, leviter arcuatus, circiter 12 cm. altus ; pseudobulbus foliatus, erectus, cataphyllis vestitus, apice 5-foleatus. *Folia* elongato-lanceolata, acuta, basi attenuata, circiter 9-nervia, subtenera circiter 18 cm. longa, 2 cm. lata. *Scapi* 1–3 suberecti, graciles, circiter 8–10 cm. longi, subpubescentes ; racemi multi et sublaxiflori. *Bracteae* saepe recurvae, ovato-oblongae, subacutae quam ovaria aequales. *Sepalum* porticum, recurvum, oblongum, obtusum, 0·7–1 cm. longum, 3-nervium ; sepala lateralia oblique ovata, subobtusa parva, recurva, 3–4-nervia, 8–10 mm. longa. *Petala* patentia, lanceolata, subacuta, 7–9 mm. longa. *Labellum* 3-lobum, 4–5 mm. longum, apice valde recurvum ; lobi laterales erecti, semiovati, acuti ; lobus intermedius oblongus, obtusus ; calli lamellae formes in disco subparalleli, discus antice saepe tuberculatus. *Columna* brevis, circiter 3·5 mm. longa. *Pollinia* anguste pyriformia. *Mentum* obtusum, 4 mm. longum.

Burma. Chin Hills, *Browne*.

This orchid at first sight suggests a large variety of *E. alba* Lindl., but the pseudobulbs are much larger and of a different build and the whole plant is more robust and floriferous. The pseudobulbs resemble those of *E. bractescens* Lindl. and are slightly curved and flattened and possess the long markings also seen in *E. excavata* Lindl. The sheathing scales of the young bulbs are large and imbricated and are about six in number. The ovaries are practically sessile and distinctly but not very hairy, and downiness is scarcely visible to the naked eye on the scape and exterior of the sepals. The petals bend slightly forward and are limper than the recurved sepals. The lip possesses a strongly recurved front lobe and erect side lobes. The exceedingly fragrant flowers are waxy white except for the lip and anther. The base of the lip is white ; the side lobes are marked with reddish-purple and the apex is yellow. The anther is also marked with reddish-purple. Besides the two distinct calli on the base of the lip there is the suggestion of a median one and a semicircle of tubercles on the anterior lobe.

The Orchid is dedicated to Major St. John A. Browne, who collected it in the Chin Hills. He forwarded it to his father, Lt.-General Sir Arthur G. F. Browne, Lower Bourne, Farnham, in whose collection it flowered in May, 1923, when it was forwarded for identification to Kew.

498. **Eria citrina** *Ridley*; affinis *E. Sonkaris* Reichb. f., floribus multo minoribus, formis labellorum distincta.

Caules plures, erecti, validi, 28–56 cm. longi, 1 cm. lati. *Folia* coriacea, oblonga, apicibus inaequaliter bilobis obtusis, nervis siccitate conspicuis, 14 cm. longa, 3 cm. lata, basi in petiolo 1 cm. longo angustata, vaginis applanatis 7 cm. longis. *Racemi* 2 vel plures, terminales, 14 cm. longi, densi flori, *Bracteae* lanceolatae, acuminatae, acumine longo reflexae, 4 mm. longae. *Pedicelli* 5 mm. longi, albo-tomentosi. *Sepalum* posticum spathulato-cymbiforme, 3 mm. longum; lateralia triangulari-obovata omnia pallide citrina extus albotomentosa. *Petala* breviora, glabra, spathulata, lanceolata, pallide citrina. *Labellum* late obovatum, 5-lobum, 5 mm. longum, lobis lateralibus latis falcatis subacutis citrinis punctis pallide rubris prope margines et apicem, epichilio bilobo, lobis oblongis lateralibus haud superantibus; in pagina interiore loborum lateralium 2 lobulis linearibus acutis, in medio labelli fusci elevato crasso flava ad apicem producto et clavato marginibus crenulatis. *Columna* brevis, crassa, pede longo canaliculato. *Anthera* ovata, citrina. *Stigma* transversim oblongum angustum.

Malaya. Borneo: Pontianak.

Mr. Ridley states that he got this pretty *Eria* from a native orchid dealer at Singapore in 1893, but never described it. It is now represented in the Royal Gardens, Kew, by a plant collected by Mr. Mohammed Haniff at Gunong Korban in Perak and forwarded to Kew in 1910. The plant has been referred by J. J. Smith and R. A. Rolfe to *E. Sonkaris* Reichb. fil., a native of Sumbawa, of which there is a type specimen in the Lindley Herbarium, but which is a totally different species with flowers not half the size.

499. **Spiranthes** (§ Euspiranthes) **Pamii** *Braid*; affinis *S. alpinae* Rodr. et *S. bicolore* Lindl. sed labellis valde distincta.

Caulis elongatus, aphyllus, subsparse vaginatus, superne brevissime et densiuscule pubescens viridis, 15–25 cm. altus. *Folia* ovata vel lanceolata, apice acuto solido, membranacea, 6–11 cm. longa, 3–4 cm. lata; petiolus circiter 3 cm. longus. *Inflorescentiae* secundiflorae, virides; bracteae lineari-lanceolatae, carnosae, trinerviae, pubescentes, floribus subaequilongis, virides, circiter 1–3 cm. longae. *Ovarium* oblongum, densiuscule pubescens, viridi-carnosum, 5–8 mm. longum. *Sepalum* dorsale anguste ovatum, apice rotundatum, uninervum, atro-viride, pubescens, fere ad apicem petalorum adnatum, 3 mm. longum, 2 mm. latum; *sepala* lateralia linearia, carnosa, subfalcata, apice subacuta, glandulosa, basi pubescentia, medio glandulosa

pubescentia, 6 mm. longa, 1–5 mm. lata. *Petala* linearia, uninervia apice rotundata, sepalo dorsali adnata, 5 mm. longa, 1 mm. lata. *Labellum* viride et album, basi inflatum, 0–8 cm. longum ; hypochilium lineare dilatatum, leviter inflatum, viride, extus pilosum, columno adnatum ; mesochilium lineare ad basim columnae adnatum ; epichilium album, pilosum, trilobum, abrupte valde dilatatum, marginibus crenulatis saepe recurvis, 3 mm. longum, 5 mm. latum ; lobus lateralis reniformis ; lobus medius amplus serratus, saepe triserratus. *Columna* brevissime viridis. *Pollinia* 2–3 mm. longa.

Var. **bruneolus** var. nov. Typo similis sed caules, vaginae, bracteae, ovaria, sepala et petala brunnescentes. Labellum album, nervo medio brunnescente.

Var. **spiralis** var. nov. Typo similis sed inflorescentia nunquam secunda.

Var. **brevipetiolatus** var. nov. Typo similis sed vix petiolatus vel petiolus brevis ; folium saepe ad 15 cm. longum, et ad 6 cm. latum.

Argentine Republic. Buenos Aires.

The plant resembles *S. alpina* Rodr. or *S. bicolor* Lindl., but the lip is quite distinct. The apex of the lip is pure white with one central green vein. The other six veins are confined to the region of the hypochile and mesochile. The dark green of the dorsal sepal contrasts strongly with the almost flesh colour of the lateral sepals, ovary and bract. The petals are a greenish-brown edged on the outer side with white, and possessing a central brown nerve. The stem and sheaths are usually green, but often a variety occurs suffused with a flesh-like colour. The plant was found at Buenos Aires and forwarded to Kew by Major A. Pam in 1923. It flowered in 1924.

Over 30 were in flower together, so it was possible to note three of the forms which vary from the type specimen. These are :—

Var. **bruneolus,** which possesses stems, sheaths, bracts, ovaries, sepals and petals suffused with a brownish colour (Ridgway's Colour Standards, Plate xxx, No. 21″ i.).

Var. **spiralis,** which differs from the type in not possessing all secund flowers ; the flowers are more or less in a normal spike.

Var. **brevipetiolatus,** which differs from the type in its petioles being short or wanting.

500. **Stenorrhynchus bonariensis** *Braid*, comb. nov. *Spiranthes* (§ Stenorrhynchus) *bonariensis* Lindl., Gen. & Sp. Orch. 475—descr. emend.

Folia circiter 4, epetiolo basi vaginante angustata, deinde oblongo-lanceolata, acuta, apiculata, ad 27 cm. longa, ad 4 cm. lata, tenuiter plurinervia, intense viridia. *Caulis* cum inflorescentia ad 55 cm. altus, 4–5 mm. latus, basi foliatus, infra leviter pilosus supra villosus, circiter 4-vaginatus ; vaginae lanceolatae, acutae, 6–10 cm. longae, supra glabrae, glandulosae, ciliatae,

infra pilosae. *Spica* densiuscula 6–15 cm. longa, circiter ad 25-flora. *Bracteae* 2–3 cm. longae, 0·8 cm. latae, erectae, lanceolatae, acuminatae, pubescentes. *Pedicellus* brevis (1–3 mm.), albus ; ovarium villosum, 12 mm. longum. *Sepalum* dorsale oblongo-lanceolatum, cuculatum, pilosum, obtusum, 15–18 mm. longum, 10 mm. latum ; sepala lateralia elliptico-falcata, concava, obtusa, depressa, villosa, 15–20 mm. longa, 5 mm. lata ; sacculum, villosum 5 mm. longum, 4 mm. latum. *Petala* glabra, obtusa, crenata, ad sepalum dorsale adnata, 15 mm. longa, 3 mm. lata. *Labellum* circiter 20 mm. longum, 10 mm. latum ; hypochilium cum 2 callis in saccis, intus pilosum ; mesochilium obovatum, carnosum, flavum, glandulosum, concavum, ad columno adnatum ; epichilium obcordatum cum mucro in sino, glandulosum, album et viride, margine crenulatum, recurvum. *Columna* alata, 16 mm. longa, 5 mm. lata, glabra, sub stigma lanuginosa ; rostellum longum, obtusum. *Anthera* parva, membrana, 4 mm. longa, 2 mm. lata. *Pollinia* adnata, falcato-clavata, farinosa ; glandula fere caerulea.

Argentine Republic. Buenos Aires.

The noteworthy points are the colours of the flower, apple-green edged or lined with white on the sepals, petals and epichile ; the white lines on the ovary ; the bright green median lines on the petals and epichile ; the orange yellow, thick, fleshy mesochile ; the blue gland to the pollinia ; the winged column and the crenate edges to the petals and epichile. On drying the fleshy mesochile appears to become thin and membranous.

The type specimen described by Lindley was collected by Tweedie at Buenos Aires and is in the Kew Herbarium. The specimen is securely gummed to a sheet and the lip is so folded that it is easily realised how Lindley mistook the shape and depicted and described it inaccurately. This error led to Cogniaux mistaking the plant when he wrote a description for *Stenorrhynchus Bonariensis* Cogn. This latter was later figured by Warming. The plant (Hort. Kew. No. 330–23) for which the above description was drawn up was received from Major A. Pam from Buenos Aires in 1923 and flowered in November of the same year ; a drawing and a photograph of it are preserved at Kew.

XXIII.—CONTRIBUTIONS TO THE FLORA OF SINALOA* : V.

L. A. M. Riley.

Rosaceae.

Couepia polyandra (*H.B.K.*) *Rose* in CNH. v. 196, 216 (1899) ; CNH. xxiii. 344.—*Hirtella polyandra* H.B.K. Nov. Gen. et Sp. vi. 246, t. 565 (1824). *Moquilea Kunthiana* Mart. et Zucc. (1832).

* Continued from *K.B.* 1923, p. 401.

Common along the west coast of Mexico, where it is evidently native (Rose). Sinaloa (fide Standley).

Vernacular name " Guayabito de tinta ".

The fruit is yellow and edible.

[**Rubus arizonicus** (*Greene*) *Rydb.* in N. Am. Fl. xxii. 446.—*Batidaea arizonica* Greene, Leaflets, i. 243 (1906). *Rubus strigosus* Seem. Bot. Herald, 282, partim, non Michx. ; Standley in CNH. xxiii. 331, partim.

Rancho of Guadalupe on the road from Mazatlan to Durango, *Seemann* 2177.

The above locality is in the state of Durango, but the species doubtless occurs in Sinaloa.

Standley (l.c.) reduced *R. arizonicus* to *R. strigosus*. The former species seems to differ in the 7-foliolate leaflets, which are more acutely dentate. Seemann's specimen consists only of a portion of a sterile branch and the determination is not certain.]

R. Palmeri *Rydb.* in N. Am. Fl. xxii. 456 (1913) ; CNH. xxiii. 332.

Sinaloa (fide Standley).

Vernacular name " Mora ".

Cercocarpus macrophyllus *C. K. Schneider*, Handb. Laubh. i. 530 (1905) ; N. Am. Fl. xxii. 419 ; CNH. xxiii. 327.—*C. fothergilloides* Seem. Bot. Herald, 283, partim ; Hemsl. Biol. i. 373, partim, non H.B.K.

Santa Lucia, *Seemann* 1979.

Fragaria mexicana *Schlecht.* ; Hemsl. Biol. i. 375 ; Rydb. in Mem. Dep. Bot. Columb. Univ. ii. 173 ; N. Am. Fl. xxii. 358. —*F. vesca* Seem. Bot. Herald, 282, non L.

Common in the Sierra Madre. *Seemann* 2178.

Vernacular name " Fresa de la Sierra ".

There are six plants on the sheet of *Seemann* 2178 in the Kew Herbarium. The indumentum of the petioles on different specimens varies from reflexed to ascending or nearly appressed.

Alchemilla procumbens *Rose* in CNH. x. 96, t. 27 (1906).—*A. sibbaldiaefolia* Seem. Bot. Herald, 282, non H.B.K. *Lachemilla procumbens* Rydb. in N. Am. Fl. xxii. 382.

Sierra Madre, *Seemann* 2179.

Saxifragaceae.

Hydrangea Seemannii *Riley*, sp. nov. ; affinis *H. Oerstedii* Briq. (*Cornidiae radiatae* Oerst.) quacum ab auctoribus quibusdam confusa esse videtur, sed ramulis fertilibus brevibus, foliis coriaceis non membranaceis pro rata angustioribus subintegris subtus non glabris utrinque luteo-viridibus, petiolis multo longioribus facile cognoscitur.

Ramuli steriles longitudinaliter rugosi, fere 7 mm. diametro 1·5 dm. infra apicem, brunneo-cinerei, glabriusculi ; fertiles 7–12·5 cm. longi, inferne glabriusculi, superne pilis parvis

stellatis ferrugineis obtecti. *Folia* lanceolata vel ellipticolanceolata, basi in petiolum angustata, apice acuta vel cuspidatoacuta rarius obtusa, 9·5–15 cm. longa, 3·5–6 cm. lata, luteoviridia, coriacea, utrinsecus 8–11-nervia, supra glabra, subnitida, conspicue reticulata, subtus obscura, pilis stellatis e punctulis brunneis orientibus mox caducis praedita, hinc glabra et brunneo-punctata, costa valde conspicua lineis brevibus et punctis notata juxta basin laminae 2·5 mm. lata, nervis lateralibus prominentibus, minutissime et remote denticulata, marginibus revolutis ; petioli 3·5–5·5 cm. longi, usque ad 3 mm. diametro. *Dichasia* in umbella unica disposita, omnino glabra ut videtur, pedunculis 0·2–2·5 cm. longis plerumque brevibus, axi primaria cum thyrso abbreviato terminali 1–3 cm. longa, axibus secundariis 2·5–5·5 cm. longis cymulas laxe et racemose dispositas gerentibus ; pedicelli sub fructu 2–3 mm. longi, florum sterilium 3·5–4 cm. longi. *Sepala* florum sterilium late obovata, 1·5 cm. longa, 1·2 cm. lata, in basin cuneato-angustata, apice truncata vel retusa, membranacea, reticulata, glabra. *Capsula* poculiformis, lateraliter striata, 3 mm. diametro, 2·5 mm. alta ; styli sub fructu circiter 2 mm. longi. *Semina* linearia, curvata, 0·5 mm. longa.—*H. peruviana* Seem. Bot. Herald, 293, quoad specimina sua, non Moric. *H. Oerstedii* Standley in CNH. xxiii. 308, quoad loc. Sierra Madre, non Briq.

Sierra Madre, common in barrancas, climbing and rooting on old trees like ivy, *Seemann* 2142 (type in Herb. Kew.) ; *Seemann* " 922 " (scripsit W. J. Hooker).

This species was included both by Seemann (l.c.) and Hemsley (Biol. i. 383), and also, apparently, by Small (N. Am. Fl. xxii. 161) in *Hydrangea peruviana* Moric. (*Cornidia peruviana* Small). Hemsley and Small further cite *Cornidia radiata* Oerst. as a synonym, Small, in addition, including *Sarcostyles peruviana* Presl. As Briquet points out (Ann. Conserv. & Jard. Bot. Genève, xx. 399), these three names belong to three different species " dont deux (*Hydrangea peruviana* et *Sarcostyles peruviana*) sont complètement étrangères à la flore de l'Amérique centrale ".

Phyllonoma coriacea *Riley*, sp. nov. ; affinis *P. laticuspidi* (Turcz.) Engl., a qua foliis coriaceis grossius serratis in acumen gradatim angustatis nervis paucioribus, inflorescentiis versus mediam laminam nec basi acuminis dispositis differt.

Rami longitudinaliter rugosi, 2·5 mm. diametro 2·5 dm. infra apicem, glabri, brunnei vel brunneo-nigrescentes. *Folia* lanceolata, 3–6 cm. longa, 0·7–2 cm. lata, in petiolum cuneato-angustata, apice longe et gradatim acuminata, fere e basi crasse calloso-serrata, acumine integro apice calloso, fulva, utrinsecus 7–9-nervia, supra nitida, glabra, costa impressa nervis lateralibus haud impressis satis conspicuis, subtus obscura, minute lepidota, costa prominente nervis lateralibus et venulis conspicuis anastomosantibus ; petioli 4–5 mm.

longi, supra canaliculati. *Inflorescentiae* 1·5–2 cm. infra apices foliorum orientes; pedunculus incrassatus, 4–5-florus, 1–1·5 mm. longus; pedicelli 2 mm. longi. *Calyx* 5-lobus, lobis cuspidato-triangulatis subacutis circiter 0·25 mm. longis. *Petala* ovato-triangulata, vix 1 mm. longa, 0·75 mm. lata, minutissime ciliata, apice subacuta. *Stamina* 0·5 mm. longa. *Ovarium* 8-ovulatum; styli 2, in disco carnoso fere 1 mm. diametro insidentes. *Bacca* prolato-sphaeroidea, 5 mm. alta, 4·5 mm. diametro. *Semina* 3 ut videtur, cylindrica, vix curvata, 1·75 mm. longa, 1 mm. diametro, nigra, verrucosa.—*Dulongia acuminata* Seem. Bot. Herald, 275, partim, non H.B.K. *Phyllonoma ruscifolia* Hemsl. Biol. i. 385, partim, non Willd. *P. laticuspis* Rusby in N. Am. Fl. xxii. 191, quoad loc. Sierra Madre, non Engl.

Sierra Madre, *Seemann* 2163 (type in Herb. Kew).

Crassulaceae.

Sedum alamosanum *S. Wats.* in PAA. xxv. 148 (1890); Lloyd Praeger in Journ. Hort. Soc. xlvi. 133, f. 69 (1921).

Providencia, *E. A. H. Tays.*

Rhizophoraceae.

Rhizophora Mangle *L.*; SBH. 283; Hemsl. Biol. i. 402.

Common along the coast (Seemann).

Combretaceae.

Terminalia Catappa *L.*; CNH. v. 221.

In the town of Rosario (Rose).

Vernacular name "Almendra".

Rose remarks that these trees seem to be frequent in the towns of Western Mexico and furnish one of the few shade-trees there, growing to the height of 35–40 feet. It is a native of tropical Asia.

Conocarpus erectus *L.*; Jacq. Amer. 78, t. 52, fig. 1; Hemsl. Biol. i. 403.

Escuinapa; Arroyo de la Codorniz, 42 m., *Gonzalez* 1130.

Vernacular name "Botoncahui".

Combretum farinosum *H.B.K.*; Pittier in CNH. xviii. 243.

Mazatlan, *Purpus* 366. San Ignacio; Pueblo de Coyotitan, 280 m., *Gonzalez* 118.

Vernacular name "Compío".

Myrtaceae.

Psidium Guajava *L.*; Popenoe, Man. Trop. Fruits, 272, t. 35.

San Ignacio; Arroyo de Tacuitapa, 300 m., *Gonzalez* 327.

Vernacular name "Guayabo".

P. Sartorianum (*Berg*) *Niedenzu.*—*Mitranthes Sartoriana* Berg in Linnaea, xxix. 248 (1857–8).

San Ignacio ; Piedras de Lumbre, 50 m., *Gonzalez* 152.
Vernacular name " Arrayán ".

This was so determined at Washington according to Señor Gonzalez. I have not seen the type of this species, and Señor Gonzalez' specimen at Kew bears neither flowers nor fruit. What there is of it agrees with Berg's description.

Eugenia Schiedeana *Schlecht.* in Linnaea, xiii. 418 (1839).
Without precise locality, *Gonzalez* 1110.
Vernacular name " Arrayán ".

Señor Gonzalez' plant shows certain points of difference from typical *E. Schiedeana*, namely in the more divergent branching, and in the shorter pedicels and much smaller bracteoles.

Myrtacea.
San Ignacio ; Honda Caña, 460 m., *Gonzalez* 858.
Vernacular names " Guayabillo ", " Arrayancillo ".

The flowers on Señor Gonzalez' specimen are in the bud stage, and are too immature for even generic determination. Expanded flowers and mature fruit are desired.

Melastomaceae.

Heeria subtriplinervia (*Link et Otto*) *Triana* in Trans. Linn. Soc. xxviii. 34 (1873).—*Melastoma subtriplinervium* Link et Otto, Ic. Pl. Rar. 47, t. 24 (1828). *Heterocentron mexicanum* Hook. et Arn. Bot. Beech. 290 ; SBH. 284 ; non Hook. Bot. Mag. t. 5166, nec Naud.

Sierra Madre, *Seemann* 2176. San Ignacio ; Cerro de la Silla, 1180 m., *Gonzalez* 734.

Monochaetum calcaratum (*DC.*) *Triana* l.c. 63.— *Arthrostemma calcaratum* DC. *Monochaetum myrtoideum* Seem. Bot. Herald, 284, non Naud.
Sierra Madre, *Seemann* 2173.

Miconia saxicola *Brandegee* in Zoe, v. 215 (1905).
Cliffs of the Cerro Colorado, *Brandegee.*

Miconia sp.
Sierra Madre, *Seemann* 2172.
Seemann's specimen is in fruit only. The material is insufficient for adequate description.

Lythraceae.

Ammannia auriculata *Willd.* ; Zoe, v. 214.
Culiacan, *Brandegee.*

Rotala dentifera (*A. Gray*) *Koehne* ; Zoe, v. 214.— *Ammannia dentifera* A. Gray.
Culiacan, *Brandegee.*

Cuphea blepharophylla (*Blake*) *Riley*, comb. nov.—*Parsonsia blepharophylla* Blake in Proc. Biol. Soc. Wash.xxxii. 190 (1919).

San Ignacio ; on the road from Yxtagua to Agua Fria, 340 m., *Salazar* 698.

C. calcarata *Benth.* var. **parastemon** *Koehne* in Engl. Pflanzenr. Lythrac. 155.—*C. calcarata* Seem. Bot. Herald, 284, non Benth.

Sierra Madre, *Seemann* 2170.

Koehne (l.c.) gives the locality of Seemann's specimen as " zwischen Zacatecas und Real del Monte ". This locality applies to another specimen altogether, viz. *Coulter* 169. The mistake has evidently arisen through a misunderstanding of Seemann's method of citing localities in the " Botany of the Herald ".

C. delicatula *Brandegee* in Zoe, v. 213 (1905).

Cofradia and Cerro Colorado, *Brandegee*.

C. Hookeriana *Walpers* forma **polysperma** *Koehne* in Engl. Bot. Jahrb. ii. 421 (1882) ; Engl. Pflanzenr. Lythrac. 176.—*C. Hookeriana* Seem. Bot. Herald, 284, partim.

Sierra Madre, *Seemann* 2171. San Ignacio ; C. de la Vieja, 1380 m., *Gonzalez* 98.

Seemann's no. 2171 is the type of forma *polysperma*. Koehne describes forma *typica* as possessing 6 (very rarely 4) petals and relatively few (14–30) ovules. I have examined several sheets of material from the type locality (Tepic) and have been unable in any case to detect more than 2 petals, although the number of ovules is about 24. Hooker and Arnott (Bot. Beech. 289) in a note to their description of *C. floribunda* (*C. Hookeriana*) remark that they have not observed the small petals, though it is not certain whether this means that they were absent. I have seen three sheets of material determined by Koehne as forma *typica* ; these specimens have 6 petals and were collected in Chiapas and Guatemala. The calyx, also, is noticeably longer than in the specimens from north-west Mexico.

C. humayana *Brandegee* in Zoe, v. 214 (1905).

Low damp ground near Culiacan, *Brandegee*.

C. Llavea *La Llave et Lexarza*, Nov. Veg. Descr. i. 20 (1824) ; SBH. 284.—*C. Llavea* var. *barbigera* Hook. et Arn. ; Koehne in Engl. Bot. Jahrb. ii. 396 (1882) ; Engl. Pflanzenr. Lythrac. 156. *C. barbigera* Hook. et Arn. Bot. Beech. 289 (1840).

Cerro de Pinal, fl. Dec., *Seemann* 1523.

Vernacular name " Yerba de San Pedro ".

The plant is used against fever (Seemann).

C. lobophora *Koehne* in Mart. Fl. Bras. xiii. pars 2, 235 (1877) ; Engl. Pflanzenr. Lythrac. 158 ; Zoe, v. 214.

Various forms collected at Culiacan, Cofradia and Cerro Colorado, *Brandegee*.

C. Palmeri *S. Wats.* in PAA. xxi. 428 (1886) ; Koehne in Engl. Pflanzenr. Lythrac. 157 ; Zoe, v. 214.

Culiacan, *Brandegee*.

I have not seen Brandegee's specimen. He describes the four ventral petals as white, whereas S. Watson describes the petals as purple.

C. Roseana *Koehne*: Engl. Pflanzenr. Lythrac. 168.—*C. trichopetala* Rose in CNH. v. 196, t. 22 (1899), non Rusby et Koehne.

Colomas, 600 m., *Rose* 1769.

Cuphea scelopetala *Riley*, sp. nov.; affinis *C. laminuligerae* Koehne, a qua foliis basi subcordatis, calyce hispidulo haud strigoso, petalis dorsualibus majoribus differt.

Caulis simplex, erectus, tenuis, 1 mm. diametro 3·5 dm. infra apicem, fulvus, crispule et minute pallido-pilosus, internodiis 3·5–7 cm. longis inferioribus brevioribus. *Folia* sessilia, e basi subcordata ad apicem obtusum gradatim attenuata, 1·5–2·5 cm. longa, basi 1–5 mm. lata, penninervia, utrinque scabro-hispidula, costa et nervis supra impressis subtus satis conspicuis, marginibus subrevolutis breviter scabro-ciliatis. *Flores* in axillis bini tergeminive; pedicelli 2–4 mm. longi; bracteolae lanceolatae, vix 0·5 mm. longae. *Calyx* 1·1 cm. longus, postice gibbosus, medio constrictus, in os dilatatus, regione angustissima 1·5 mm. lata, purpurascens, setuloso-hispidus, intus ore lanato, lobo dorsuali triangulato 2·5 mm. alto duabus squamis munito, ventralibus 0·5 mm. altis. *Petala dorsualia* late obovata, 6 mm. longa, 4·5 mm. lata, in unguem 2·5 mm. longum angustata, violacea, crenulata; ventralia oblanceolata, 5 mm. longa, 2 mm. lata, brevissime unguiculata, integra, pallida. *Stamina* 11, omnia fertilia; filamenta glabra, longiora 3 mm., breviora 2 mm. longa. *Ovarium* disco dorsuali carnoso pendente, 3·5 mm. longum 1·5 mm. latum, 6-ovulatum, leviter pilosum; stylus 6 mm. longus, glaber.

Sinaloa: San Ignacio; R. de Los Otates, 320 m., *Gonzalez* 440 (type in Herb. Kew.).

Lawsonia inermis *L.*; Koehne in Engl. Pflanzenr. Lythrac. 270.—*L. alba* Lam., nomen abortivum; Watt, Dict. Econ. Prod. India, iv. 597–602; Kew Bull. Add. Ser. ix. 322.

Cosalá; Conitaca, 150 m., *Gonzalez* 825.

Vernacular name "Reseda".

This plant—the "Henna" of Africa and the East—is probably a native of north and north-east Africa, and western and southern Asia, whence it has been introduced into cultivation in all the warmer parts of the world.

Onagraceae.

Jussieua octofila *DC.* in DC. Prodr. iii. 57 (1828).—*J. octovalvis* Swartz, partim, non *Oenothera octovalvis* Jacq. *J. octonervia*

Micheli in Mart. Fl. Bras. xiii. pars 2, 170, partim, non Lam. *J. suffruticosa* Urb. Symb. Antill. iv. 468, partim, non L.

Mazatlan, *Coulter* 181. San Ignacio ; Agua Caliente, 170 m., *Gonzalez* 346.

Lamarck (Encycl. iii. 332 ; 1789) based *J. octonervia* on *Oenothera octovalvis* Jacq., which is a glabrous plant. He explained the change of the specific name on the ground of inappropriateness. Swartz (Obs. Bot. 142 ; 1791) restored Jacquin's specific name, and cited his plant, but in his description referred to it as pubescent. De Candolle (l.c.) separated the pubescent form as *J. octofila*, citing Plum. ed. Burm. t. 175, fig. 1. Unfortunately the description accompanying Plumier's figure refers to the plant as glabrous. Urban cited both species as synonyms of *J. suffruticosa* L. As Ridley (Journ. Bot. 1921, 257) points out, *J. suffruticosa* L. is founded on Rheede's figure and description (Hort. Malab. ii. 95, t. 49) which has very short fruit and petals shorter than the calyx-lobes, and seems to be a very distinct plant. In *J. octofila* the petals are longer than the calyx-lobes, the fruit is about 4·5 cm. long, and two slender bracteoles may usually be found either at the apex of the pedicel or along the calyx-tube. Until the genus can be competently revised it seems desirable to keep these species distinct.

I refer to this species also :—Guaymas, *Palmer* 257 ; Acapulco, *Palmer* 213 ; Mexico, *Beechey*.

[**J. repens** *L.* should occur in Sinaloa, but I have found no records.]

Semeiandra grandiflora *Hook. et Arn.* Bot. Beech. 291, t. 59 ; SBH. 283.

Sierra Madre, *Seemann* 2168. San Ignacio ; C. de la Silla, 1200 m., *Gonzalez* 294.

Lopezia conjugens *Brandegee* in Univ. Calif. Publ. Bot. vi. 59 (1914).

Near Cofradia, *Brandegee*.

Brandegee remarks that this species is "intermediate between *Lopezia* proper and *L. clavata* which has been included by Dr. Rose in his genus *Pelozia*".

Lopezia pauciflora *Sprague et Riley* in Journ. Bot. 1924, 15, diagnosis tantum ; quoad flores *L. oaxacanam* Rose et *L. strictam* Rose revocans, ab illa indumento caulis et foliorum, unguibus petalorum anteriorum longis linearibus, ab hac sepalis extra setulosis differt.

Caulis teres, gracilis, flexuosus, patule ramosus, 1·5 mm. diametro 4 dm. infra apicem, superne crispule pilosus, inferne breviter retrorsum appresse setulosus ; internodia 1·5–3 cm. longa. *Folia* lanceolata vel rarius ovato-lanceolata, 2–5 cm. longa, 0·5–2·5 cm. lata, apice breviter acute acuminata, basi cuneata, sparse inconspicue denticulata, inferiora praecipue

subtus densiuscule pubescentia, superiora sparsius induta ; petioli graciles, dense crispule pubescentes, ei foliorum inferiorum 0·8–1·9 cm. longi, ei foliorum superiorum 2–5 mm. longi ; folia ramorum minora, angustiora. *Racemi* axin primariam et ramos terminantes, laxi, pauciflori, bracteis etiam supremis plus minusve foliaceis. *Pedicelli* filiformes, sub lente conspicue pilosi, circiter 1·4–1·8 cm. longi, sub fructu vix elongati. *Sepala* linearia, obtusa, 5·5–6·5 mm. longa, extra setulosa, posterius et anterius basi circiter 1 mm. lata, lateralia angustiora. *Petala anteriora* 7·5–7·75 mm. longa, ungue 2·75 mm. longo lineari, lamina oblongo-obovata in unguem angustata circiter 5 mm. longa 2·5 mm. lata ; petala posteriora circiter 7 mm. longa, bituberculata et biappendiculata, ungue infra tubercula 1·75 mm. longo, appendiculis patentibus vel leviter ascendentibus, parte supra appendiculas in toto 5 mm. longa anguste spathulata conspicue unguiculata, lamina parva 0·75 mm. lata. *Filamentum* 4 mm. longum, parte inferiore lineari carnosa 2·8 mm. longa, parte superiore filiformi-subulata 1·2 mm. longa ; anthera oblongo-linearis, 1·8 mm. longa, basi sagittata. *Staminodium* 5·5 mm. longum, ungue circiter 2 mm. longo oblongo-lineari sursum sensim angustato medio 0·5 mm. lato, lamina elliptico-obovata vix ultra 3 mm. longa et 2 mm. lata apice retusa, sinu 0·2 mm. alto apiculato. *Ovarium* glabrum, stylo tandem 4 mm. longo. *Capsula* suborbicularis, circiter 2·5 mm. diametro. —*L. racemosa* Seem. Bot. Herald, 283 (1856), non Cav.

Sierra Madre, *Seemann* 2169 partim (type in Herb. Kew.).

Seemann's no. 2169, which he identified as *Lopezia racemosa*, comprised two species, *L. pauciflora* and *Pelozia laciniata* Rose.

[**Lopezia tepicana** *Sprague et Riley* in Journ. Bot. 1924, 15, diagnosis tantum ; quoad flores *L. oaxacanam* Rose et *L. strictam* Rose revocans, ab illa sepalis glabris, petalis posterioribus latius spathulatis, unguibus petalorum anteriorum filiformibus, ab hac forma petalorum posteriorum, ab ambabus caule retrorsum appresse setuloso, foliis utrinque dense setulosis differt.

Caulis strictus, ramosus, teres, gracilis, 2 mm. diametro 5 dm. infra apicem, setulis brunneis retrorsum appressis indutus ; internodia 5–6·5 cm. longa. *Folia* lanceolata vel ovato-lanceolata, 3–3·5 cm. longa, 1·3–1·7 cm. lata, apice breviter acute acuminata, basi cuneata, minute sparsiuscule denticulata, itaque primo visu leviter undulata, utrinque dense setulosa, supra setulis e basi tuberculari subulatis inflatis ad 1·75 mm. longis statu vivo ut videtur non appressis, subtus costa nervisque lateralibus patenter appresse setulosis ceterum setulis sparsioribus pilisque nonnullis minoribus induta ; petiolus 0·7–1 cm. longus, retrorsum setulosus ; folia ramorum lanceolata, 0·9–1·8 cm. longa, 2–7 mm. lata, subsessilia vel petiolo usque ad 2 mm. longo, basi cuneata vel saepe rotundata, apice acuta. *Racemi* axin primariam et ramos et eorum ramulos termin-

antes, ei axis primariae 15–25 cm. longi, ramorum 8–15 cm. longi, ramulorum 4–6 cm. longi. *Bracteae* subulatae vel inferiores lineari-lanceolatae, plerumque 1–3 mm. longae, inferiores usque ad 6·5 mm. longae. *Pedicelli* axillares, solitarii, filiformes, primo visu glabri, revera minutissime sparse glanduloso-puberuli, circiter 1 cm. longi, sub fructu patentes vel sursum curvati, 1·5–2 cm. longi. *Alabastra* primum clavata, acuta, demum dimidio inferiore incrassato suboblonga, acuta, medio constricta, circiter 5 mm. longa. *Sepala* 4·5-5 mm. longa, glabra ; posterius et anterius sublinearia, superne per 1 mm. in apicem obtusum angustata, basi 0·9–1 mm., superne 0·7 mm. lata ; lateralia subspathulato-linearia, inferne et superne 0·7 mm., medio 0·4 mm. lata. *Petala anteriora* 5·5 mm. longa, ungue lineari, lamina obovata 2·75 mm. longa 2 mm. lata ; petala posteriora 6 mm. longa, bituberculata et biappendiculata more *L. oaxacanae*, ungue infra tubercula 1·5 mm. longo, tuberculis 0·4 mm. longis, appendiculis 0·7 mm. longis patentibus sursum concavis vel leviter descendentibus, parte supra appendiculas in toto 4 mm. longa spathulata conspicue unguiculata, ungue 1·4 mm. longo, lamina 1 mm. lata. *Stamen* 4·5 mm. longum ; filamenti pars inferior carnosa, linearis, 2·5 mm. longa, basi 0·6 mm. lata, superne 0·4 mm. lata, pars superior filiformi-subulata, 1 mm. longa ; anthera oblongo-linearis, basi sagittata, 1·75 mm. longa, 0·3 mm. lata, sinu basali 0·6 mm. alto. *Staminodium* 4 mm. longum, ungue infra medium geniculato, parte infra geniculum 1 mm. longa 0·7 mm. lata, parte supra geniculum 1·3 mm. longa medio 0·25 mm. lata, lamina elliptica anguste retusa 2·25 mm. longa 1·8 mm. lata, sinu 0·2 mm. alto tuberculato-apiculato. *Ovarium* circiter 1 mm. diametro, glabrum ; stylus 2·5 mm. longus. *Capsula* suborbicularis, circiter 2·3 mm. diametro, glabra.— *L. hirsuta* Hook. et Arn. Bot. Beech. 291 (1840) ; Benth. Bot. Sulph. 93 (1844) ; SBH. 283 (1856) ; non Jacq.

Tepic : near the town of Tepic, *Sinclair* (type in Herb. Kew.), *Barclay*, *Beechey*.

Two different species may be represented on Barclay's sheet, the larger specimen being *L. tepicana*. The smaller specimen differs in the spreading indumentum of the stem, and the more compact infructescence. Beechey's sheet consists of three specimens, the central one being *L. tepicana*. The specimen at the top left-hand corner of the sheet differs in the longer pedicels (over 1·5 cm. in flower), in the buds remaining clavate until the expansion of the flower, and in the staminode, which has a larger, more deeply retuse lamina and a shorter claw. The material of the third specimen is inadequate.]

Pelozia laciniata *Rose* in CNH. xii. 296 (1909).—*Lopezia racemosa* Seem. Bot. Herald, 283, partim, non Cav.

Sierra Madre, frequent, *Seemann* 2052, 2169 partim.

I have not been able to compare Seemann's plants with any specimens of *P. laciniata*. My determination is based on Rose's description and figure. With these Seemann's specimens agree, except that the stems are shorter (10–30 cm.) and the leaves deeply, rather than shallowly, toothed.

Seemann (Bot. Herald, 283) gives "Fuchsia sp. (Leaves only). Sierra Madre, near Santa Lucia". I have not found any of his material, and it is probable that he did not preserve any specimens. Nor have I found any record of the genus from localities further north than Michoacan and Hidalgo. It is possible that Seemann's generic determination was incorrect.

Samydaceae (Flacourtiaceae).

As pointed out by Sprague in Journ. Bot. 1922, 72, the correct name of the family under International Rules is *Samydaceae*, not *Flacourtiaceae*.

Prockia crucis *L.*; CNH. xxiii. 840.
Sinaloa (fide Standley).

Xylosma velutinum (*Tul.*) *Triana et Planch.* Prodr. 97 (1862). —*Flacourtia velutina* Tul. *Myroxylon velutinum* Warb.; Standley in CNH. xxiii. 841.
Sinaloa (fide Standley).
In the Index Kewensis this species is wrongly attributed to "Triana and Karsten in Karsten, Fl. Columb. i. 123, t. 97 (1858)," which error is followed by Standley (l.c.).

Casearia arguta *H.B.K.* Nov. Gen. et Sp. v. 364.
Escuinapa; Cerro del Muerto, 39 m., *Gonzalez* 1128.
Vernacular name "Cuacoyolillo".

I have compared Señor Gonzalez' plant with the original description, from which it differs in the smaller leaves which are somewhat pilose on the upper surface. The original specimen, however, was evidently more mature, as it did not bear flowers but only fruits. For this reason the determination cannot be regarded as certain, as Señor Gonzalez' plant bears flowers and leaves only. From Central American material hitherto referred to *C. arguta* it differs in the smaller leaves and larger flowers. The type locality near La Venta del Exido is about 20 miles inland from Acapulco on the road to Chilpancingo.

C. dolichophylla *Standley* in CNH. xxiii. 846 (1923).
Sinaloa (fide Standley).
Vernacular name "Chililló".
Standley refers here "a large number of specimens all of which may not be conspecific." Before seeing his description of *C. dolichophylla* I had drawn up a description of *Gonzalez* 326 from Sinaloa as a new species of *Casearia*. Standley cited *Purpus* 7447 from Oaxaca as the type of *C. dolichophylla*. As I have not seen this, and also as the Sinaloa specimen

bears considerably laxer inflorescences than specimens from Guerrero and Nicaragua which seem referable to *C. dolichophylla*, I append my original unpublished description of the Sinaloa plant, which may prove to be different.

Ramus annotinus unicus exstans vix flexuosus, albido-cinerascens, longitudinaliter rugosus, glaber, 3 mm. diametro 2 dm. infra apicem, foliis jam delapsis. *Ramuli hornotini* exstantes abbreviati, e perulis quatuor cuspidato-triangulatis 2 mm. longis orientes, 3–5 cm. longi, brunnei, molliter et breviter pilosi, basi praecipue lenticellis pallidis valde suberosis oblongo-linearibus usque ad 2·5 mm. longis muniti, corymbos axillares 2–4 gerentes, in innovationes desinentes. *Folia* ramulorum elliptico-oblonga, 2–3 cm. longa, 1–1·6 cm. lata, apice rotundata, basi subcordata crenulato-dentata, utrinque pallide pilosa. *Inflorescentiae* pedunculo 0·5–1 cm. longo incluso 2·5–3 cm. longae, gracillime flexuosae ; pedicelli 4–5 mm. longi ; bracteae lanceolatae, usque ad 1 mm. longae. *Sepala* elliptica, apice rotundata, 3·25 mm. longa, 1·75 mm. lata, molliter pilosa. *Stamina* octo, 2·5 mm. longa ; antherae 0·75 mm. longae ; filamenta 1·75 mm. longa, pilosiuscula. *Staminodia* villosa. *Ovarium* ampullaceum, cum stylo 3 mm. longum, vix 1 mm. diametro, pilosum ; ovula circiter 20.

Sinaloa : San Ignacio ; Tacuitapa, 300 m., *Gonzalez* 326 (Herb. Kew).

Vernacular names " Chilillo ", " Garrapatilla ".

C. laevis *Standley* in CNH. xxiii. 845 (1923).
Mazatlan, *Rose, Standley and Russell* 14154.

C. obovata *Schlecht. ;* CNH. xxiii. 845.
Sinaloa (fide Standley).

C. Pringlei *Briquet* in Ann. Conserv. & Jard. Bot. Genève, ii. 65 (1898) ; CNH. xxiii. 846.
Sinaloa (fide Standley).

Loasaceae.

Mentzelia adhaerens *Benth.* Bot. Sulph. 15 ; Zoe, v. 213.
Cerro Colorado, *Brandegee.*

Turneraceae.

Turnera humifusa (*Presl*) *Endl.* ; CNH. v. 166, 230.—*Bohadschia humifusa* Presl Reliq. Haenk. ii. 98, t. 68 (1836). *T. diffusa* Urb. in Jahrb. Bot. Gart. Berlin, ii. 125, partim ; Standley in CNH. xxiii. 848, partim. *T. aphrodisiaca* L. F. Ward in Virginia Medical Monthly, April 1876, p. 49, teste Rose.

Between Rosario and Colomas, *Rose* 1612. La Noria, above Mazatlan, *Rose.*

Vernacular name " Damiana ".

Used as a tea and taken to relieve pain in the stomach and bowels (Rose).

T. Pumilea *L.* ; Urb. in Jahrb. Bot. Gart. Berlin, ii. 314 (1883).
San Ignacio ; C. del Potrerillo, *Gonzalez* 609.
Vernacular name " Bruja ".

T. ulmifolia *L.* var. **caerulea** (*DC.*) *Urb.* l.c. 144 ; CNH. v. 166.—*T. caerulea* DC. *T. ulmifolia* Standley in CNH. xxiii. 847.
Cerro de Pinal, *Seemann* 1515. San Ignacio ; Yxtagua, 600 m., *Gonzalez* 470. Colomas, *Rose* 1692.

Caricaceae.

Carica Papaya *L.* ; Popenoe, Man. Trop. Fruits, 224 et seq.
Without locality, *Gonzalez* 239.
Vernacular names " Copal ", " Cucaracho ".

C. sp.
Brandegee (Zoe, v. 213) mentions a plant which he found to be not uncommon about Cofradia. The local name is " Quadratos " and he states that it is " evidently near *C. caudata* of the Cape Region of Baja, California ".

Passifloraceae.

Passiflora foetida *L.* ; Mart. Fl. Bras. xiii. pars 1, 582.
Choix ; Tasajera, 420 m., *Gonzalez* 878.
Vernacular name " Clavellín blanco ".

P. mexicana *A. Juss.* in Ann. Mus. Hist. Nat. Paris, vi. 108, t. 38, f. 2 ; SBH. 345.—*P. jorullensis* Hemsl. Biol. i. 478, partim, non H.B.K.
Islands in the harbour of Mazatlan, fl. Dec., *Seemann* 1516.

Cucurbitaceae.

Luffa operculata var. **intermedia** *Cogn.* in CNH. i. 330 (1895) ; CNH. v. 122.
Agiabampo, *Palmer* 770. Ymala, *Palmer* 1686.

Schizocarpum Palmeri *Cogn. et Rose* in CNH. i. 100 (1891) ; CNH. v. 124 ; Zoe, v. 221.
Ymala, *Palmer* 1693 ; " the most common cucurbit " (Brandegee).

Momordica Balsamina *L.* ; Fedde, Repert. xiv. 113.
On the lower Rio del Fuerte near Zaragoza, *Endlich* 713.
Vernacular name " Balsamina ".

M. Charantia var. **abbreviata** *Ser.* in DC. Prodr. iii, 311 ; Cogn. in DC. Monogr. iii. 437.— *M. zeylanica* Mill. ; CNH. v. 122 ; CNH. viii. 193.
Culiacan, *Palmer* 1522. San Ignacio ; Pueblo de Ajoya, 265 m., *Gonzalez* 60.
Vernacular name " Pepino ".

Roseanthus elongatus *Rose* in CNH. viii. 337 (1905) ; Zoe v. 222.
Cerro Colorado, *Brandegee.*

Cucurbita radicans *Naud.*; Cogn. in DC. Monogr. iii. 548; CNH. v. 121; Zoe, v. 222.

Culiacan, *Palmer* 1802. Altata to Cofradia, *Brandegee.*

Vernacular name "Chicoyote".

Melothria Donnell-Smithii *Cogn.* in Bot. Gaz. xvi. 9 (1891); CNH. v. 122.

Lodiego, *Palmer* 1604.

Maximowiczia sonorae *S. Wats.* in PAA. xxiv. 51 (1889); Zoe, v. 221.

Altata, *Brandegee.*

Brandegee remarks that the leaves and fruit are smaller than those of specimens from Guaymas—the type locality.

Apodanthera Roseana *Cogn.* in CNH. iii. 318 (1895); Zoe, v. 221.

Ymala, *Palmer* 1444. Altata to Culiacan, *Brandegee.*

Cayaponia dubia (*Hook. et Arn.*) *Rose* in CNH. v. 236.—*Anguria ? dubia ?* Hook. et Arn. Bot. Beech. 292. *Cayaponia attenuata* (Hook. et Arn.) Cogn. in DC. Monogr. iii. 769. *Bryonia attenuata* Hook. et Arn. Bot. Beech. 424.

Common on the west coast of Mexico, *Rose* 1481.

Said to be used in the place of soap (Rose).

Echinopepon cirrhopedunculatus *Rose* in CNH. i. 100, t. 4 (1891); CNH. v. 115; Zoe, v. 222.

Cerro Colorado, *Brandegee.*

E. lanatus (*Cogn.*) *Rose* in CNH. v. 117; Zoe, v. 222.—*Echinocystis lanata* Cogn.

Common over the whole region, *Brandegee.*

I have followed Rose (l.c.) and Dunn (*Kew Bull.* 1913, 148), in maintaining *Echinopepon* as a genus distinct from *Echinocystis.*

Elaterium longisepalum *Cogn.* in CNH. iii. 318 (1895); Zoe, v. 222.

Lodiego, *Palmer* 1600. Common in ravines, *Brandegee.* San Ignacio; Arroyo de Coacoyol, 420 m., *Gonzalez* 587.

I have not seen an authenticated specimen of *E. longisepalum*, and have determined Señor Gonzalez' plant from the description, with which it agrees except as regards the leaves, which, in a young state, are minutely setulose on the upper surface, and, in a mature state, are minutely and densely tuberculate on the lower surface.

Cyclanthera micrantha *Cogn.* in CNH. iii. 318 (1895); Zoe, v. 222.

Ymala, *Palmer* 1706; common in Sinaloa, *Brandegee.*

Sicyos acerifolius *Brandegee* in Univ. Calif. Publ. Bot. vi. 370 (1917).

Cofradia, *Brandegee.*

S. sinaloae *Brandegee*, l.c.

Culiacan and Cofradia, *Brandegee.*

CACTACEAE.

In the circumscription and sequence of genera I have adopted the plan of Britton and Rose's "Cactaceae".

Pereskiopsis Porteri (*Brandegee*) *Britton et Rose* in Smiths. Misc. Coll. l. 332 (1907); Cact. i. 28, f. 26.—*Opuntia Porteri* Brandegee ex Weber in Bois, Dict. Hort. 899.

Sinaloa, without precise locality (Weber, Britton and Rose).

Opuntia decumbens *Salm-Dyck*, Hort. Dyck. 361 (1834); Britton and Rose, Cact. i. 116, t. 20, ff. 1, 2.

Mazatlan (Britton and Rose).

O. fulgida *Engelm.* in PAA. iii. 306 (1856); Britton and Rose, l.c. 67, t. 12, f. 1.

Sinaloa (Britton and Rose).

O. Thurberi *Engelm.* l.c. 308; Britton and Rose, l.c. 53, f. 63.

Sinaloa (Britton and Rose).

[**O. tunicata** (*Lehmann*) *Link et Otto* in Pfeiff. Enum. Cact. 170 (1837); Coulter in CNH. iii. 444; Britton and Rose, l.c. 65, f. 80, t. 10, f. 1.—*Cactus tunicatus* Lehmann, Ind. Sem. Hort. Hamb. 5, 16 (1827).

Throughout Mexico (Coulter). Highlands of Central Mexico (Britton and Rose).

This species is reported from Sonora and Raza Island, and is distributed through the West Indies and South America, according to Coulter, but I have no actual record from Sinaloa.]

O. Wilcoxii *Britton et Rose* l.c. 172, f. 211 (1919).

Common on the hills in the coastal plain from southern Sonora to southern Sinaloa (Britton and Rose). Fuerte, *Rose, Standley and Russell* 13546.

Cephalocereus Purpusii *Britton et Rose*, Cact. ii. 56 (1920).

Mazatlan and Guadalupe, *Rose, Standley and Russell* 13749, 14741.

Pachycereus pecten-aboriginum (*Engelm.*) *Britton et Rose* in CNH. xii. 422 (1909); Cact. ii. 70, ff. 105, 106.—*Cereus pecten-aboriginum* Engelm. in PAA. xxi. 429 (1886); CNH. v. 253, 254.

On the west coast the Indians use the fruits as hairbrushes, which brushes Dr. Palmer observed in the houses of many Indians and poor Mexicans in Sonora and Sinaloa. The branches are cut off and set together to form hedges (Rose).

Wilcoxia papillosa *Britton et Rose*, Cact. ii. 112 (1920).

Culiacan, *Purpus*. San Ignacio; Tinamaxtita, 1340 m., *Mexican Commission* 848.

Vernacular name "Cardoncillo".

W. striata (*Brandegee*) *Britton et Rose* in CNH. xii. 434 (1909); Cact. ii. 111.—*Cereus striatus* Brandegee in Zoe, ii. 19 (1891); CNH. i. 331.

Agiabampo, *Palmer* 794.

Acanthocereus occidentalis *Britton et Rose*, Cact. ii. 125, f. 185 (1920).

San Blas, Mazatlan and Guadalupe, *Rose, Standley and Russell* 13431, 14050, 14752. Rosario, *Rose* 3170.

Confined to low thickets along the coast of Sinaloa (Britton and Rose).

Rathbunia alamosensis (*Coulter*) *Britton et Rose* in CNH. xii. 415 (1909); Cact. ii. 170, t. 25, ff. 1, 2.—*Cereus alamosensis* Coulter in CNH. iii. 406 (1896); Zoe, v. 190.

Topolobampo, *Porter*.

Vernacular name "Cina".

Specimens from Sinaloa and Tepic formerly assigned by Britton and Rose (l.c.) to *R. Kerberi* (K. Schum.) are now referred by them to *R. alamosensis*.

Selenicereus vagans (*K. Brandegee*) *Britton et Rose*, Cact. ii. 205, ff. 284, 285.—*Cereus vagans* K. Brandegee in Zoe, v. 191 (1904).

El Creston, Mazatlan, *Brandegee*.

Echinocereus scopulorum *Britton et Rose*, Cact. iii. 30, f. 34 (1922).

Topolobampo, *Rose, Standley and Russell* 13349.

Echinofossulocactus phyllacanthus (*Mart.*) *Lawrence* in Loud. Gard. Mag. xvii. 317 (1841); Britton and Rose, l.c. 118, f.124. —*Echinocactus phyllacanthus* Mart.

Reported from Mazatlan (Britton and Rose).

Ferocactus Wislizeni (*Engelmann*) *Britton et Rose*, l.c. 127, tt. 1, 12, f. 2.—*Echinocactus Wislizeni* Engelmann in Wisliz. Mem. Tour North Mexico, 96 (1848); CNH. i. 331.

Agiabampo, *Palmer* 803.

Mamillopsis Diguetii (*Weber*) *Britton et Rose*, Cact. iv. 20.—*Mammillaria senilis* var. *Diguetii* Weber in Bull. Mus. Hist. Nat. Paris, x. 383 (1904).

Sierra de Chabarra, Concordia, *Gonzalez*.

M. senilis (*Lodd.*) *Weber* in Bois, Dict. Hortic. 805 (1898) in obs.; Britton and Rose, l.c. 19, ff. 19, 20, 21.—*Mammillaria senilis* Lodd. ex Salm-Dyck, Cact. Hort. Dyck, 8, 82 (1850); Scheer in SBH. 286; K. Schum. Gesamtbeschreib. Kakt. 511 (1898).

Sierra Madre (Seemann).

Neomammillaria mazatlanensis (*K. Schum.*) *Britton et Rose* Cact. iv. 138.—*Mammillaria mazatlanensis* K. Schum. in Monatsschr. Kakt. xi. 154 (1901); Gürke, ibid. xv. 154, cum tab.

Mazatlan, on hills near the sea, *Rose*.

N. Ortegae *Britton et Rose*, l.c. 83, fig. 75 (1923).

Sinaloa, *Gonzalez*.

FICOIDACEAE.

[**Mollugo verticillata** *L.*
This undoubtedly occurs in Sinaloa, but hitherto I have found no record.]

UMBELLIFERAE.

Eryngium Beecheyanum *Hook. et Arn.* Bot. Beech. 294 (1840); Proc. Wash. Acad. Sc. i. 124.
Sierra de Choix, *Goldman* 270.

E. crassisquamosum *Hemsl.* in Hook. Ic. Pl. t. 2765 (1903).—*E. pectinatum* Seem. Bot. Herald, 294, partim; Hemsl. Biol. i. 561, partim; non Presl.
Sierra Madre, *Seemann* 2136.

E. cryptanthum *Hemsl.* in Hook. Ic. Pl. t. 2509 (1897).—*E. Beecheyanum* Seem. Bot. Herald, 294, partim; Hemsl. Biol. i. 560, partim; non Hook. et Arn.
Sierra Madre, *Seemann* 2135.

Museniopsis biennis var. **pinnatisecta** *Riley*, var. nov.; foliis caulinis majoribus pinnatisectis argutius dentatis a typo recedit. — *Velaea toluccensis*? Seem. Bot. Herald, 294, non DC. *Arracacia* sp. Hemsl. Biol. i. 564.
Sierra Madre, *Seemann* 2134.

M. peucedanoides (*H.B.K.*) *Coulter et Rose* in CNH. iii. 303 (1895); Proc. Wash. Acad. Sc. i. 132.—*Cnidium peucedanoides* H.B.K. *Eulophus peucedanoides* Benth. et Hook. f. *Velaea peucedanoides* Drude.
Near Colomas, *Rose* 1743.

[**Apium leptophyllum** *F. Muell. ex Benth.*; Sprague in Journ. Bot. 1923, 129–133.— *A. Ammi* Urb.; Coult. et Rose in Proc. Wash. Acad. Sc. i. 144 (1900).

Widely distributed in America from the Southern United States to Chile and the Argentine. As it is recorded from La Paz, Lower California, and from near the city of Durango, it may be expected to occur in Sinaloa.]

Coulterophytum macrophyllum *Coulter et Rose* in Proc. Wash. Acad. Sc. i. 156 (1900).
Near Colomas, *Rose* 1814.

Prionosciadium spp.; Coulter and Rose, l.c. 152.
Two species collected at Colomas, *Rose* 1649, 1815, are tentatively referred by Coulter and Rose (l.c.) to this genus.

Deanea glauca *Coulter et Rose*, l.c. 156 (1900).
Near Colomas, *Rose* 1781.

XXIV.—NEW OR NOTEWORTHY SOUTH AFRICAN PLANTS*.—VI.

J. Burtt Davy.

91. **Thalictrum minus** *L.* var. **caffrum** (*E. and Z.*) *Burtt Davy*, var. nov. ; *T. caffrum* Eckl. & Zeyh., Enum. : 1 (1835). *T. minus* Harv. in Harv. & Sond. Fl. Cap. 1 : 3 (excl. syn. Engl. Bot. t. 11) non L.

South Africa. Transvaal : Banks of the Vaal River near Potchefstroom, *Nelson* 71 ! and near Vereeniging, flg. Nov., *Pott* 3753 ! Cape Province : Katriviersberg, at Silo on the Klipplaatrivier, *E. and Z.* 3 ! (type). Also in Orange Free State and Basutoland.

Differs from glaucous forms of *T. minus* in the shorter (2–2·5 mm.) anthers with longer (about 0·5 mm.) usually recurved apiculus, and in the prominently nerved and thicker sepals. *T. minus* var. *scabrivena* Oliv. of Abyssinia differs from our plant in the much longer (3 mm. and more) anthers, and the scabrid veins on the under surface of the leaflets.

It is instructive to note that no form of *T. minus* appears to have been found in the extensive botanical collections made in that long stretch of temperate mountainous country intervening between the Transvaal and Abyssinia.

92. **Hexalobus monopetalus** (*A. Rich.*) *Engl. & Diels*, Monogr. 56 (1901). *Uvaria monopetala* A. Rich. *Hexalobus senegalensis* A. DC.

South Africa. Transvaal : Zoutpansberg Distr. ; Waterpoort, *Rogers* 21545 ! This appears to be the most southern locality for this Tropical African species.

93. **Nymphaea calliantha** *Conard* var. **Nelsonii** *Burtt Davy*, var. nov. ; a *N. calliantha* Conard sepalis petalisque brevioribus 4 cm. longis obtusis differt.

South Africa. Transvaal : Potchefstroom Distr. ; Mooi River at Wonderfontein, *Nelson* 71 ! (type).

Herb aquatic. *Leaves* floating ; blades green above, often purple or purplish beneath, 13–28 cm. long, 12–17 cm. broad, the basal lobes approximate or overlapping, acute, acuminate or shortly caudate ; ribs on the under surface only moderately raised ; leaf-margins entire (or not dentate, though sometimes obsoletely sinuate or repand). *Flowers* 10–15 cm. diameter, white, pale bluish, blue or pink. *Sepals* ovate-lanceolate (narrowed towards the base), 6–7 cm. long, obtuse, with black linear dashes near the margin (or these sometimes wanting). *Petals* 15 to 25, lanceolate, obtuse, up to 4 cm. long and 1·5 cm. broad. *Filaments* 0·4 cm. broad at base. *Anther-appendages* 0·6 cm. long, 1 mm. broad at base, subacute, yellow.

* Continued from *Kew Bulletin*, 1922, p. 335.

94. **Cleome maculata** (*Sond.*) *Burtt Davy*, comb. nov. *Polanisia maculata* Sond. in Linnaea 23 : 6 (1850). *Tetratelia maculata* Sond. in Harv. & Sond. Fl. Cap. 1 : 58 (1860). *Chilocalyx maculatus* Gilg & Benedict in Engl. Jahrb. 53 : 168 (1915).

95. **Cleome Conrathii** *Burtt Davy*, comb. nov. *Polanisia triphylla* Conrath in Kew Bull. 1908 : 220 ; non *Cleome triphylla* L.

96. **Cleome rubella** *Burch.*, Travels 1 : 543 (1822). *C. rupestris* Sond. in Linnaea 23 : 6 (1850).

An examination of Burke's specimen of *C. rupestris* from the Vaal River (the twin specimen of Zeyher's type), and of numerous examples of *C. rubella* from the Transvaal, Griqualand West and Bechuanaland, including Burchell's type, shows them to be conspecific.

97. **Cleome Breyeri** *Burtt Davy*, sp. nov. ; *C. pachycephalae* Gilg et Bened. affinis, sed frutex ramosus, petiolis foliolisque brevioribus obovoideis vel rhomboideis, staminibus magis numerosis, differt.

South Africa. Transvaal : Zoutpansberg Distr. ; Wylies Poort, near Louis Trichardt, *Dr. Breyer in herb. Transv. Mus.* 19442 ! (type).

Shrub with woody branching stem, minutely glandular-pubescent throughout. *Leaves* 5-foliolate ; petioles of medial leaves about 2 cm. long ; leaflets obovate to rhomboid, acute, sparsely ciliate towards the base with minute bristles, glabrous above, the medial 1·7–2 cm. long, 6–7 mm. broad. *Inflorescence* clothed with small sessile 3-fid bracts ; lower flowers scattered ; pedicels 1·2–1·5 cm. long. *Sepals* lanceolate, acuminate, densely clothed (or not) with dark purple stalked glands. *Petals* clawed, the 2 larger 1–1·2 cm. long, pink concolorous, the 2 smaller pink in the upper part, yellow below. *Stamens* 14, 4 long fertile, 10 short and with smaller (abortive ?) anthers. *Pod* 6 cm. long over all ; stipe 5 mm. long ; beak 4 mm. long ; valves many-ribbed.

98. **Cleome Nationae** *Burtt Davy*, sp. nov. ; *C. maculatae* Burtt Davy affinis, sed foliolis latioribus linearibus vel linearilanceolatis, staminibus 6 omnibus fertilibus, capsulis brevioribus, differt.

South Africa. Transvaal : Rustenburg, flg. Jan. 1905. *Nation* 214 ! (type). Portuguese East Africa : Lourenco Marques, *Schlechter* 11516 !

Herb annual, 20–45 cm. high. *Stem* glabrous, branched. *Leaves* 3-foliolate ; petiole 1·5–4 cm. long ; leaflets 1·5–3 cm. long, 2–3 mm. broad, linear to linear-lanceolate, acute, glabrous above, minutely and sparsely scaberulous on the margins and under-surface. *Pedicels* 1–3 mm. long ; flowers 6–9 mm. long. *Calyx* with a short gibbous tube ; lobes 2 mm. long, subulate to lanceolate-acuminate. *Petals* truncate, veiny, white or yellowish.

pinkish towards the tips (or pink throughout ?). *Stamens* 6, all fertile. *Pod* (mature) 5–8 cm. long over all, striate ; stipe 3·4 mm. long ; beak 3–5 mm. long. *Seeds* as in *C. maculata* but smaller, dark brown, the transverse crests closer together and less elevated.

Other specimens from Delagoa Bay (e.g. *Monteiro* 42) may belong here, but the petals are longer and pink throughout.

C. Nationae resembles *C. tenuifolia* Kl., but differs in the smaller flowers, shorter stipe, and fewer stamens.

99. **Maerua Legatii** *Burtt Davy*, sp. nov. ; *M. buxifoliae* Gilg et Bened. affinis, sed foliis minoribus dense pubescentibus, petalis 0, differt : a *M. parvifolia* Pax foliorum magnitudine forma et pubescente, et papillarum charactere et positione, differt.

South Africa. Transvaal : Zoutpansberg Distr., Blaauwkop, 660 m. alt., Sept. 1908, *Legat* 46 ! *in S. Afr. Nat. herb.* 4903! (type) ; Messina, 600 m., *Rogers* 1930 ! 19345 ! Waterpoort, 650 m., *Rogers* 21510 !

Shrub distinctly pubescent ; branchlets 6–30 cm. long, straight, minutely grey-tomentose, glabrescent in age. *Leaves* densely fascicled, subsessile, simple, 6–10 mm. long, 2–3 mm. broad, obovate to oblanceolate, mucronate, glaucous to green, minutely and densely papillose above, densely tomentose beneath. *Flowers* solitary, axillary ; pedicels 1 cm. long ; receptacle 3–5 mm. long, ribbed. *Sepals* 8 mm. long 3–3·5 mm. broad, green. *Petals* 0. *Androphore* exserted about 1 mm. beyond the receptacle. *Gynophore* about 1·3 cm. long ; young fruit minutely grey-puberulous.

Allied to *M. parvifolia* Pax, but differs in size, shape and tomentose under-surface of the leaves, and the character and position of the papillae.

100. **Hybanthus Thorncroftii** (*N. E. Br.*) *Burtt Davy*, comb. nov. *Ionidium Thorncroftii* N. E. Br., Kew Bull. 1921 : 289.

South Africa. Transvaal : Barberton, on a hillside at Reimers Creek, 1050 m. alt., flowers pale blue, Nov. 1920, *G. Thorncroft* 1086 ! (type).

101. **Polygala producta** *N. E. Brown*, Kew Bull. 1895 : 143, emend. *Burtt Davy*. *P. Rehmannii* var. *parviflora* Chod., Monog. Polygal. 362 (1893). *P. asperifolia* Chod. in Engl. Jahrb. 48 : 323 (1912).

In 1893 Prof. Chodat described *Polygala Rehmannii*, based on *Rehmann* 4635, and a variety *parviflora* founded on *Rehmann* 4565. In 1895 Mr. N. E. Brown published *P. producta*, citing *Galpin* 844, *Rehmann* 4565 and nine other specimens, as belonging to his new species, but without designating any one of them in particular as the type. In 1912 Prof. Chodat, overlooking Mr. Brown's name, redescribed *Galpin* 844 as *P. asperifolia*.

A study of the Kew material of *P. Rehmannii*, *producta* and *asperifolia* shows that all but two of the specimens cited by Mr. Brown under *P. producta* are referable to *P. Rehmannii* (of which the type, *Rehmann* 4635, is not at Kew). The two residual specimens represent a second species. One of them (*Rehmann* 4565) is the type-number of *P. Rehmannii* var. *parviflora*, and the other (*Galpin* 844) is the type-number of *P. asperifolia*. The question now arises, what name this second species should bear. The varietal name *parviflora* is excluded under Art. 49 of the International Rules, and the choice accordingly lies between *P. producta* (1895) and *P. asperifolia* (1912). Under the type-method a specific name stands or falls by its type-specimen, so that it is necessary in the first place to ascertain the type of *P. producta*. Where several specimens were originally cited and none was designated as the type, a type-specimen should be selected in accordance with the following considerations. It should be the specimen on which the original description was based, or which the author had chiefly in mind. This may be indicated by closer agreement with the original diagnosis or description, by manuscript notes left by the author, or sometimes by the specific name. Mr. Brown's description of *P. producta* covers all the specimens cited, and there is no indication on the herbarium sheets as to which was the type. The diagnostic character of the elongated raceme, to which the specific name *producta* refers, is, however, most pronounced in *Galpin* 844, and as this was also the first specimen cited by Mr. Brown it may be chosen as the type.

The same result would be attained by the method of residues, the name *P. producta* being applied to what is left after removal of the material referable to the previously described *P. Rehmannii*, namely *Galpin* 844 and *Rehmann* 4565.

Whenever an author, in describing a new species, cites more than one specimen, it is desirable that he should designate one of these as the type, in order to determine the application of the name in the event of subsequent segregation.

102. **Cerastium capense** *Sond.* in Harv. & Sond. Fl. Cap. 1 : 131 (1860).

South Africa. Transvaal : Witwatersrand ; in marshy places near Elsburg, Oct. 22, 1893, *Schlechter* 3546 ! Lydenburg Distr. ; Lydenburg, *Wilms* 66 ! *Rogers* 14571 ! Bethal Distr. ; Bethal, *Pott* 3595 ! Carolina Distr. ; Carolina, *Mos; & Rogers* 1063 ! 1227 ! Ermelo Distr. ; Ermelo, *Burtt Davy* 1863, *Rogers* 14060! Wakkerstroom Distr. ; Volksrust, *Mogg* 9726 ! Also in the Orange Free State, and the Eastern and Western areas of the Cape Province. Sonder cites *Ecklon & Zeyher* 265, 266, 267, and *Zeyher* 1965b from Table Mt. (summit and below), Caledon Baths, Zwartkops River and Adow.

Our material has been variously referred to *C. viscosum* var. *elongatum* Druce, and to closely allied British forms, but neither

Dr. G. Claridge Druce nor Mr. C. E. Salmon will admit it as conspecific with any British species. Mr. Salmon reported of South African specimens submitted to him : " I should say we have *nothing* in Britain that could be called either *C. capense* or *C. arabidis*."

103. **Cerastium Dregeanum** *Fenzl.* in Ann. Wien. Mus. 1 : 341 (1836). *C. brachycarpum* E. Mey. ex Gren., Monog. Cerast. p. 64, t. 6 (1841).

South Africa. Transvaal : Witwatersrand ; in damp places near Elsburg, Oct. 22, 1893, *Schlechter* 3537 ! Lydenburg Distr. ; Belfast, 6400 ft. alt., Dec. 1909, *Worsdell* ! Carolina Distr. ; Carolina, *Rogers* 19788 ! Orange Free State : Nelson's Kop, in 1862, *Cooper* 1950 ! Natal : Umzimkulu, *Miss E. Groom in herb. Wood* 1770 ! Illovo, grassy hill, Apl. 30, 1883, *Wood* 1820 ! Van Reenen's Pass, 1700–1900 m. alt., Mch. 20, 1894, *O. Kuntze* ! Charlestown, Nov. 14, 1913, *Mogg* 9623 ! Olivers Hoek Pass, Jan. 18, 1886, *Wood* 3559 ! Basutoland : Leribe, 1500–1800 m. alt., Jan. 1913, *Dieterlen* 935 ! Eastern Cape Province : Katberg and Los Tafelberg, 1500–1700 m. alt., *Drège* ! (types). Transkei : Black Rock Cave, Kentani, *Pegler* 1291 ! Bazeia, *Baur* 500 ! Western Cape Province : Western slopes of Orange Kloof, *Wolley Dod* 3503 !

This has been referred to the European *C. arvense* L., but as Mr. C. E. Salmon and Dr. G. Claridge Druce point out, the long capsule keeps it out of that species. *C. arabidis* E. Mey., to which specimens have been referred, differs in the oblong to oblong-lanceolate lower leaves, which are ciliate with long (up to 2 mm.) white hairs, and in the narrower, shorter petals.

104. **Sagina maxima** *A. Gray* var. **parviflora** *Burtt Davy*, var. nov. ; a *S. maxima* A. Gray habitu humilior tenuior floribus minoribus differt.

South Africa. Transvaal : Pretoria, *Burtt Davy* ; Vereeniging Distr. ; Burttholm, Uitgevallen 197, June 1917, a garden weed, *Burtt Davy* 17524 ! *in herb. Cantab.*

Japan. Yokoska, 1866–74, *Dr. Lud. Savatier* 128 !

China. W. Yunnan : Tali Range, lat. 25° 40′ N., in " dry barren situations along the base of the eastern flank," 2100 to 2400 m. alt., Apl.-May, 1906, a plant 1 to 4 in. high, flowers white, *Forrest* 4301 ! (type) ; Hu-Pe : Ichang or immediate neighbourhood, *A. Henry* 3652 ! Manchuria : road between Ninguta and Omoso, in the Valley of Ell-dshañ-cho, 20 July, 1896, *V. Komarôv* 616 !

Herb annual, with prostrate or ascending diffuse slender stems, about 6 cm. high. *Leaves* glabrous, filiform or subulate to narrow-linear, mucronate, 0·8–1 cm. long. *Pedicels* axillary, slender, 1–2·3 cm. long, glandular-pubescent to glabrescent. *Flowers* small, 2·5–3 mm. long when in fruit. *Sepals* more or less minutely glandular-pubescent, 1·5–2 mm. long. *Petals*

shorter than the sepals, white. *Capsule* exceeding the sepals, about 3 mm. long.

Almost certainly introduced into South Africa with roots of *Iris Kaempferi* imported direct from Japan to my garden in Pretoria, and transferred in 1913 to my garden at Burtthollm. *S. maxima* has been referred to S. *Linnaei* Presl (*S. saginoides* (L.) Dalla Torre) which differs in its perennial habit, petals much longer than the glabrous sepals, glabrous pedicels, and longer capsule.

105. **Silene Burchellii** *Otth.* in DC. Prodr. 1 : 374 (1824). *S. pilosellaefolia* Ch. and Schl. in Linnaea 1 : 41 (1826). *S. Thunbergiana* E. and Z. Enum. : 32 (1834). *S. Burchellii* var. *pilosellaefolia* Sond. in Harv. & Sond. Fl. Cap. 1 : 128 (1860).

The following note on this species, by the late Dr. Bolus, is preserved at Kew :—" Harvey (in his Flor. Cap. 1 : 128) does not quote, and probably had not seen, Burchell's No. 271, which was the type specimen of this species. Consequently he has described from other forms. On the other hand *S. Thunbergiana* E. and Z., founded on their No. 253, is obviously identical with Burchell's No. 271 ; the last name, *S. Thunbergiana* E. and Z., must therefore be suppressed.

" The forms hitherto commonly marked in Herbaria ' *S. Burchellii* Otth.' (see Burchell's Nos. 580, 1254, 6789, and many recent collectors) must, I think, be regarded as a mere variety, with more erect habit, and generally a tendency to narrower leaves, No. 271 being the maritime form, with broader leaves. (See also Gerrard's No. 605 from Natal). These forms are connected by intermediate states, but I can find no differences whatever in the calyx-teeth or fruit.

" Under these varieties and under various names (including *S. chirensis* Rich., *S. sericea* Rich., etc.), this species extends very widely over Africa from the Cape to Abyssinia.—*H. Bolus* ".

The following are referable to the typical form, which is a maritime plant not found in the interior :

South Africa. S.W. Cape Prov. : Cape Div. ; Kloof between Lion's Head and Table Mt., on the side towards Camps Bay, *Burchell* 271 ! (type) ; Table Mt., steep ascent facing Cape Town, *Burchell* 580 ! Lion's Head, flg. Sept., *Dr. Pappe* ! Lion's Rump, flg. Jul.–Aug. 1846, *R. C. Alexander* ! " C.B.S. ", *Dr. Harvey* ! Leeuwenberg, below 1,000 ft., flg. Oct., *Drège* ! (sub. nom. *S. crassifolia*), *Eckl. & Zeyh.* 253 ! (type of *S. Thunbergiana*). Eastern Cape Prov. : Uitenhage, flg. Oct., *Dr. Pappe* ! Zwartkops Rivier and Adow, *Eckl. & Zeyh.* 257.

var. **angustifolia** *Sond.* in Harv. & Sond. Fl. Cap. 1 : 128 (1860). *S. cernua* Bartl., non Thunb., teste Sond. *S. sericea* Rich., non All. *S. chirensis* Rich. teste Oliver.

South Africa. S.W. Cape Prov. : Cape Div. ; Simons Bay, *MacGillivray* 662 ! Table Mt., 700 ft., flg. Sept., *Bolus* 4709 ! Eastern Cape Prov. : Zwartkops River, *Dr. Pappe* ! Algoa Bay, *Forbes* ! Grahamstown, *MacOwan* 58 ! Basutoland :

Leribe, *Dieterlen* 362 ! Orange Free State : Thabanchu, flg. Feb., *Burke* ! *Zeyher* 84 in part (part of type). Natal : without precise locality, *Cooper* 1943 ! Transvaal : Rustenburg, fl. and frt. Jan., *Nation* 223 ! Heidelberg, flg. Nov., *Leendertz* 2517 ! Mooifontein, flg. Oct., *Schlechter* 3560 ! Haenertsburg, flg. Nov., *Pott* 4610 ! Bosch's, near Barberton, 1200 m., flg. Dec., *Galpin* 1270 !

Tropical Africa. S. Rhodesia ! Nyasaland ! Tanganyika Terr. ! Kenya ! Abyssinia ! Eritrea !

Some of the Transvaal material (e.g. *Pott* 4610) is a good match of *Bolus* 4709 from Table Mt. Forms intermediate between this and the preceding, and this and the following, are frequent.

var. **latifolia** Sond. in Harv. & Sond. Fl. Cap. 1 : 128 (1860).

South Africa. Transvaal : Shady places at the Crocodile River, Magaliesberg, in 1841, *Zeyher* 84 in part (type) ; Standerton, flg. Nov., *Wilms* 64 ! Natal : without precise locality, *Gerrard* 605 ! Inanda, *Wood* 393 ! Near Durban, *Wood* 122 !

Tropical Africa. Nyasaland : Shire Highlands, *Buchanan* 3 ! *Adamson* 65 ! Zomba, *Purves* 164 !

106. **Silene gallica** *L.*, Sp. Pl. 417 (1753). *S. anglica* L., *S. lusitanica* L., *S. quinquevulnera* L., Sp. Pl. 416 (1753).

South Africa. Transvaal : not infrequent as an adventive weed in fields of corn and forage.

By European botanists most of the plants bearing the above names are often treated as separate forms, varieties or subspecies.

Under Art. 46 of the International Rules, the name *S. gallica* stands for the typical form, having been retained for the species when *S. anglica* was united with *S. gallica* by Mertens & Koch, under the name *S. gallica* var. *anglica*. Under the " American " code, however, the name *S. anglica* is retained for the typical form, as having " priority of place ".

107. **Garcinia transvaalensis** *Burtt Davy*, sp. nov. ; species a *G. Gerrardio* Harv. affinis, sed sepalis paullo brevioribus, petalis multo majoribus, staminibus longioribus, et foliorum forma magnitudine et nervatione, differt.

South Africa. Transvaal : Barberton Distr. ; Reimers Creek, near Barberton, 1400–1500 m. alt., *Galpin* 1202 ! (type).

Tree 20 ft. high. *Branchlets* 4-angled, the angles more or less winged. *Petiole* thick, about 1 cm. long ; leaf-blades elliptic, acute, mucronate, tapering to the base, 6–7 cm. long, 3–4·5 cm. broad, dark green, glossy, leathery ; secondary veins more or less arcuately curved, 0·6–1 cm. apart ; leaf-margin cartilaginous. *Flowers* terminal on long leafy branchlets, cream-coloured. *Sepals* 2 mm. long, 2·5 mm. broad. *Petals* 6 mm. long, 8 mm. broad. *Filaments* 4-adelphous, the bundles 5 mm. long, their branches many and about 1 mm. long. *Fruit* ?

In comparison with *G. Gerrardii* the leaves are noticeable for the absence of the fine straight tertiary veins, arising from the bases of the secondary veins, which divide the lower leaf-surface of that species into rhombic areoles.

108. **Erythroxylon Brownianum** *Burtt Davy*, nom. nov. *E. monogynum* Harv. in Harv. & Sond. Fl. Cap. 2 : 591, non Roxb.

South Africa. Transvaal : Saddleback Mt. near Barberton, on dry hillsides at 900–1000 m. alt., *Galpin* 1134 ! Also in Natal !

Resembling *E. monogynum* Roxb., but distinguished by the shorter petioles and free styles.

109. **Oxalis Galpinii** *Burtt Davy*, sp. nov.; *O. oligotrichae* Bak. affinis, sed foliolorum forma amplitudineque, epidermidis cellulis majoribus, foliorum marginibus revolutis, foliis paucioribus, petiolis robustioribus, floribus magis numerosis, petiolorum pilis ascendentibus, differt.

South Africa. Transvaal : Barberton Distr.; Umlomati Valley, 1200 m. alt., flg. Sept. 1890, *Galpin* 1010 *in Herb. Kew.* ! (type).

Herb perennial acaulescent from a bulbiferous rhizome. *Leaves* 3-foliolate ; petioles 6–10 cm. long, pilose with lax hairs which are more ascending than spreading ; leaflets ovate, rounded to obtuse from a cuneate base, 2–4 cm. long, 2–3·2 cm. broad, margins narrowly revolute, sparsely ciliate. *Peduncles* 9–11-flowered equalling or exceeding the leaves, pilose ; pedicels 1–1·5 cm. long, pilose. *Sepals* pilose, 5 mm. long strongly callosed with about 4 salmon-coloured calli. *Petals* about 1·3 cm. long, bluish or lilac.

Allied to *C. oligotricha* Baker, of Lake Tanganyika, but differing in the shape and breadth of the leaflets, the larger epidermal cells, revolute leaf-margins, lesser degree of hairiness, fewer leaves, stouter petioles, and more numerous flowers, and in the hairs on the petioles being more ascending than spreading.

110. **Drosera madagascariensis** DC., Prodr. 1 : 318 (1824). *D. curvipes* Planch. *D. ramentacea* var. *curvipes* Sond.

South Africa. Transvaal : Pretoria Distr.; Magaliesberg, *Burke* ! *in herb. Hook.* (type of *D. curvipes* Planch.), *Zeyher* ! Waterberg Distr.; Nylstroom River, *Nelson* 293 ! Geelhout-kop, *Breyer in Herb. Trans. Mus.* 17800 ! Pietersburg Distr.; Woodbush Hill, *Pott* 4609 ! Lydenburg Distr.; O'Neill's Farm, *Wilms* 33 ! Belfast, common in the wet peaty soil of a " pan ", flg. Feb., *Burtt Davy* 1311 ! Middelburg Distr.; Klein Olifants River, flg. Dec., *Schlechter* 4022 ! Ermelo Distr.; Mavieriestad, *Pott* 5095 ! Heidelberg Distr.; Heidelberg, *Leendertz* 1064 ! Swaziland : near Mbabane ?, *Bolus* 11877. Also in Natal, Orange Free State and Madagascar (*Lyall* 123 ! type).

111. **Drosera Collinsiae** *N. E. Brown*, sp. nov.; *D. madagascariensi* affinis, sed ab omnibus speciebus africanis

australibus foliis late spatulato-orbiculatis, petiolisque longissimis tenuissimis differt.

South Africa. Transvaal: Rustenburg, *Miss Collins* 127 *in Herb. Kew.*! (type).

Herb acaulescent (?), with long wiry roots. *Leaves* forming a basal rosette (sometimes cauline ?), 2·5–5 cm. long inclusive; petiole very long and slender, three to four times the length of the blade; blade 0·8–1·3 cm. long, 0·5–1 cm. broad, spatulate-obovate to spatulate-orbicular, not or but slightly longer than broad, rather abruptly cuneate at base, ciliate-dentate. *Scape* 0·6–1·2 cm. long, very slender, glandular-puberulous on the flowering part, glabrous below; pedicels 0·5–0·9 cm. long. *Corolla* apparently purple (1·2–1·5 cm. diam. ?).

The only specimens seen have long wiry roots as in some of the caulescent species, though they do not show definite evidence of a stem; the petals have collapsed, but apparently the flower does not exceed 1·5 cm. in diameter.

112. **Aristolochia Bainesii** *Burtt Davy*, sp. nov.; *A. albidae* Duch. affinis, sed perianthii labellis brevioribus obtusioribusque, racemorum breviorum floribus paucioribus, et foliis majoribus acuminatis, differt.

South Africa. Transvaal: Pietersburg Distr. ?; "South African Goldfields", *Baines in Herb. Kew.*! (type). Reported also from the Zoutpansberg District.

Tropical Africa. Nyasaland: Ntondwe, in 1894, *K. J. Cameron in Herb. Kew.*!

Climber, shrubby. *Stem* and branches angular sulcate, glaucescent and glabrous, slender. *Petiole* about 1·5 cm. long. *Leaf-blades* 6·5–7 cm. long, 4·5–5 cm. broad at base, ovate, deeply cordate, acuminate, 7-nerved, green and smooth above, prominently reticulate and slightly roughish and glaucescent beneath. *Racemes* axillary, 4-5-flowered; bracts foliaceous, ovate-cordate, obtuse, up to 2 cm. long and 1·7 cm. broad, resembling the leaves in texture and reticulation; pedicels 3 cm. long. *Perianth* about 3·1 cm. long; labellum 1·8 cm. long, about 0·5 cm. broad, the margin slightly undulate. *Capsule* about 8 cm. long including the 3·5 cm. long stipe, opening upwards (from the basal attachment towards the apex). *Seeds* much compressed, triangular, acuminate, 1·3 cm. long, 0·9 cm. broad, margined and with 2 prominent ridges, the margin 2·5–3 mm. broad.

Allied to *A. albida* Duch., of Upper Guinea, differing in the shape and relative length of the labellum, the shorter and fewer-flowered racemes, and the more acuminate leaves. *A. Petersiana* Klotzsch, to which it has been referred, differs in the longer labellum and the more obtuse leaves which are not prominently reticulate beneath.

113. **Dioscorea Junodii** *Burtt Davy*, sp. nov.; *D. rupicolae* Kth. affinis, sed racemis compositis, foliorum lobis centralis

brevioribus latioribusque, nervis non reticulatis subtus minus prominentibus, petiolis longioribus, staminibus 6, differt.

South Africa. Transvaal: Pietersburg Distr.; Valley of Schambock's Stadt, near Shilouvane Sanatorium, flg. Jan.–Feb., *Junod* 1416 ! (type).

Stems 3–4 m. long, very slender, twining, glabrous, finely ridged. *Leaves* alternate; petiole 1·7–2 cm. long, slender; blades simple, truncate- (or very shallowly cordate-) hastate, glabrous, about 4·5 cm. long and 5 cm. broad, distinctly but shallowly 5-lobed; central lobe about 3 cm. long by 2.5 cm. broad, acutely pointed but scarcely mucronate, narrowing at its base, 3-nerved from base to apex; lateral lobes spreading, each usually with a small lateral lobe on the lower side; nerves not prominent nor reticulate. *Male flowers* in compound racemes, solitary in the leaf-axils, about 5 cm. long; lower flowers of the raceme 2–3 on a common peduncle 2–3 mm. long, the upper often solitary; rhachis and peduncles more or less winged or angled. *Bracts* longer than the peduncles; bracteoles about equalling the very short pedicels. *Perianth* shortly campanulate, about 9 mm. diameter when expanded; tube 1 mm. deep; lobes 4 mm. long, acuminate, dotted with yellowish-brown glands. *Stamens* 6. *Female flowers* and *fruit* not seen.

114. **Dioscorea (Testudinaria) brevipes** *Burtt Davy*, sp. nov.; *D. sylvaticae* E. Mey. affinis, sed pedicellis brevioribus, floribus minoribus et perianthii segmentis angustioribus, differt.

South Africa. Transvaal: Waterberg Distr.; Potgietersrust, flg. Nov. 1908, *Leendertz* 1510 ! (type); Pietersburg Distr.; Forest of Marovougne, near Shilouvane, flg. Jan., *Junod* 857 ! Lydenburg Distr.; in bush at the river near Lydenburg, flg. Feb., *Wilms* 1496 ! Barberton Distr.; among rocks, hillside near the Edwin Bray Battery, Barberton, 660 m. alt., flg. Nov., Dec., *Galpin* 1185 ! Orange Free State: near Harrismith, flg. Jan., *Sankey* 314 ! Natal: Greenwich Farm, near Rietvlei, flg. Dec., *Harold Fry* ex *herb. Galpin* 5727 !

Stems 1–2 m. long, moderately stout to slender, twining, glabrous, slightly compressed and distinctly ridged. *Leaves* alternate; petiole 1·1–1·5 cm. long, shallow-channelled above; blades simple, cordate-hastate, glabrous, glaucous beneath, 3·2 (or less)–4 cm. long (from apex of petiole to apex of leaf), 3·9–5·8 cm. broad at base, distinctly but shallowly 3-lobed; central lobe abruptly or gradually tapering into a mucro 1·5–2·5 mm. long; lateral lobes widely divaricate from the petiole, rounded and quite entire; nerves 9, more or less prominent beneath. *Male flowers* in simple spike-like racemes, solitary in the leaf-axils, 5–7 cm. long; rhachis and peduncles narrowly ridged or angled. *Bracts* shorter than the pedicels, bracteolate at apex, the bracteole shorter than the perianth-tube. *Pedicels* about 2 mm. long. *Perianth* campanulate, 3–4 mm. diameter; tube about 1·5 mm. deep, dark purplish-brown; lobes about 2 mm. long, 0·7 mm. broad, purplish below, pale yellow above.

Stamens 6. *Female flowers* in axillary racemes ; pedicels about 2 mm. long, 4 mm. apart ; ovary about 3 mm. long and perianth-lobes about 2 mm. long (only unopened buds seen). *Fruit* not seen.

115. **Dioscorea Brownii** *Schinz* in Mem. Herb. Boiss. No. 20 : 11 (1900). *D. Tysonii* Schoenl. in Rec. Alb. Mus. 1 : 49 (1903) ; non *D. Tysonii* Baker in Journ. Bot. 18 : 2 (1889), Fl. Cap. 7 : 252 (1896).

South Africa. Griqualand East : Zuurberg, *Tyson* 1829 ! (type).

Both of the above specific names were established on the same type-specimen, with simple, entire leaves. *D. Tysonii* Baker has a compound leaf of 5 leaflets and was founded on *Tyson* 1646, from the vicinity of Fort Donald, Griqualand East.

116. **Dioscorea cotinifolia** *Kunth*, Enum. Pl. 5 : 386 (1850). *D. malifolia* Baker in Journ. Bot. 18 : 1 (1889) ; Fl. Cap. 7 : 248 (1896).

South Africa. Transkei : Tembuland ; Morley, 300–600 m. alt., *Drège* 4500 ! (type of *D. cotinifolia* Kth.; also cited by Baker as part of his *D. malifolia*). E. Cape : Kentani, in woods, climbing about 8 ft., flg. Jan., *Pegler* 739 ! 1812 ! Bathurst Div.; between Rietfontein and Kowie River, *Burchell* 4001 ! Also in Natal and Transvaal.

117. **Zantedeschia melanoleuca** *Engl.* var. **concolor** *Burtt Davy*, var. nov.; a forma typica foliorum maculis minoribus paucioribusque, spatha concolore, differt.

South Africa. Transvaal ? : Without precise locality, the type grown from tubers imported by Messrs. F. Sander & Co., St. Albans, in, or before, 1898 ; Lydenburg Distr., without precise locality, flowered in 1905 by C. G. van Tubergen, Jr., Haarlem, Holland, from tubers received " a few years " previously.

Messrs. Sander and Co. received the plant from South Africa with the statement that it is " a hybrid between *Richardia Elliottiana* var., and a South African species with creamy bell-shaped flowers with a broad purple centre " (*R. melanoleuca* ?). The term hybrid may have been used here in a loose popular way to designate a variation or sport ; it is very doubtful whether there were any hybridists dealing with Zantedeschias in South Africa at that time. Mr. van Tubergen states in a letter preserved at Kew that his plant " reproduces itself perfectly true from seeds. It is deciduous and loses its foliage in the autumn".

Z. melanoleuca was figured in Bot. Mag. t. 5765. Our plant differs in the fewer, smaller and more irregular white spots on the leaves and the absence of the purple blotch at the base of the spathe within. Fresh material may show further and specific differences between the two.

118. **Zantedeschia oculata** (*Lindl.*) *Burtt Davy*, comb. nov.; *Calla* ? *oculata* Lindl. in Gard. Chron. 1859 : 788. *Richardia hastata* Hook. f. in Bot. Mag. 16 (Ser. 3), t. 5176 (1860). *Zantedeschia hastata* Engl., Jahrb. 4 : 64 (1883).

South Africa. Natal : Without precise locality, *Sanderson* ! *Wood* 2 ! Near Maritzburg, fl. Oct. 1883, *Wilms* 2335 ! Basutoland, in 1861, *Cooper* 3327 ! Transvaal : Lydenburg, at the river, fl. Jan. 1895, *Wilms* 1574 ! Barberton Distr.; swamps in the Umlomati Valley, 1200 m. alt., fl. Dec. 1891, *Galpin* 1360 !

The original description was drawn from a specimen imported from Natal in 1857 by Messrs. Veitch, in whose nurseries at Exeter the plant proved hardy. Messrs. Veitch's correspondent described the plant as " a yellow Calla, which, from its smallness and beauty and being also hardy, will be much prized. You must not give too much water ; it grows here in stiff marl and sand on high ground under shade, consequently merely damp soil ". Lindley describes the flower as " a clear rich yellowish green, with a deep purple eye ". Galpin terms it " cream-colour with brown centre ", and the plant as growing " in swamps ". Cooper describes the bottom of the spathe inside as " purple ".

119. **Zantedeschia Elliottiana** (*Knight*) *Burtt Davy*, comb. nov. *Calla Elliottiana* Knight ex W. Wats. in Gard. Chron. 12, Ser. 3, 123 (1892). *Richardia Elliottiana* Hort. ex Mottet in Rev. Hortic. 67 : 38 (1895) ; E. de Duren in Rev. Hort. Belg. 23 : 13 cum tab. (1897) ; Hook. f. in Bot. Mag. t. 7577 (1898).

South Africa. Without precise locality : grown from seed received from " South Africa " in 1886, *Knight*. Transvaal : Wakkerstroom Distr.; near Amersfoort, flowering Nov. 1895, *Burtt Davy* 4095.

Described as being the largest species of the genus hitherto known. At first considered to be " perhaps a variety of *R. albomaculata* ", a species which belongs to the hastate-leaved group, and has a relatively small spathe, white with a purple blotch within, with a limb much longer, narrower and more tapering than that of *Z. Elliottiana*. The latter differs from *R. angustiloba*, the other golden-spathed species, in its " much larger size, broad spotted leaves more deeply cordate at the base, the smooth surface of the limb of the spathe within, and the absence of purple colouring at its base ; also in the large ovaries and sessile stigma ".

120. **Zantedeschia Sprengeri** (*Comes*) *Burtt Davy*, comb. nov. *Richardia Sprengeri* Comes in Atti Inst. Incorazz. Napoli, Ser. 5, vol. 3, No. 7 ; Bot. Centralbl. 89 : 660 ; N. E. Brown in Gard. Chron. 31 : 349 (1901), 32 : 350 (Nov. 15, 1902).

Petiole 15–17·5 cm. long, smooth, without bristles at the base ; blade 20–22·5 cm. long, 7·5–8·5 cm. broad, oblong, acute at the apex, truncate (not hastate nor cordate) at the base, green, marked with semi-transparent white spots, and sometimes

variegated as well with white. *Peduncle* 30–35 cm. long, smooth, glabrous. *Spathe* broadly funnel-shaped, bright clear yellow, varying to sulphur-yellow or white, or sometimes spotted; when flattened out measuring 10–10·5 cm. long (exclusive of the 1·2–1·8 cm. long subulate cusp), and 12·5–13 cm. in breadth, somewhat transversely rhomboid-ovate or rhomboid-orbicular in outline. *Spadix* shortly stipitate, not half as long as the spathe. *Ovaries* without neuter organs mingled with them, somewhat 4-angled, with sinuous sides as viewed from above, flattened at the top: stigma sessile. (*N. E. Brown.*)

South Africa. Transvaal: without precise locality, *Hort. Sprenger.*

Mr. Brown describes this as a fine and distinct species, introduced from the Transvaal in the winter of 1898 by Mr. C. Sprenger of Naples, and first flowered with him in the summer of 1900. It is one of the yellow-flowered group, "rivalling *R. Pentlandii* and *R. Elliottiana*" in colour, and has equally large if not larger spathes, differing from those and all other species in the form of its leaves and the broader, funnel-shaped, or somewhat trumpet-mouthed spathes, which, when flattened out, are broader than those of any other species.

XXV.—THE FLORA OF MADRAS: V.

The fifth and sixth parts (pp. 769–1160), *Ebenaceae* to *Plantaginaceae*, completing the *Gamopetalae*, have now been published, and Mr. Gamble has drafted the following notes on continuation of those previously published.*

Notes on the Flora of Madras.

J. S. Gamble.

Part I.—Dipterocarpaceae.

Page 82 *Hopea.* Specimens received from India, from the Forest Research Institute, Dehra Dún, show that Wight and Arnott, quite correctly, separated *H. glabra* from *H. Wightiana* Wall., as was rightly maintained in the "Flora of British India". A new species of the genus, *H. canarensis* Hole in Ind. For. xliv. 578, was published in Dec., 1918, and forms the subject of a note in "Indian Forest Records", Vol. vii. with plate. It is allied to *H. racophloea* Dyer and has the same glands in the nerve axils of the leaves, and broader wings to the fruit. It is found in the Hills of the W. Ghâts, on the boundary line between S. Canara and Mysore. Vern. *Kan.* Malai haiga. A large tree with clean bole reaching 60 ft. and a girth of 6–8 ft.

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* See *K.B.* 1916, p. 57; 1918, p. 222; 1920, p. 49; 1921, p. 312.

ICACINACEAE.

Page 198 *Pyrenacantha*. This interesting plant now, from specimens recently available, proves to have a wider range than was before recorded, viz.: E. Ghâts, Hills of Vizagapatam at 3000 ft. (*A. W. Lushington*); Carnatic, in N. Nellore (*Fischer*), in addition to those already mentioned.

Part III.—ONAGRACEAE.

Page 516 *Jussieua*. According to Ridley in Journ. Bot. LIX., 257, *J. suffruticosa* Linn. should be subdivided into :—

(i) *J. suffruticosa* Linn. Kuthuparamba in Malabar (Coll. *K. Rangachari*)—*J. fissendocarpa* Haines in Journ. As. Soc. Beng. XV. (1919) 313, t. ix.

(ii) *J. villosa* Lam. Plains country on both sides of the Peninsula, in wet places, common.

(iii) *J. speciosa* Ridl. l.c., a tall herb with large flowers and capsule and densely softly tomentose leaves, found in swampy places in Wynaad at about 3000–4000 feet (*Beddome, Gamble, Bourne*).

I am glad to put this on record as, when working on the genus, I was much in doubt about the large-flowered plant and ought myself to have made the separation now so properly made by Mr. Ridley. *J. speciosa* is a very distinct and handsome species.

Part V.—SOLANACEAE.

Page 932 *Solanum*. The "Fl. Br. Ind." keeps distinct No. 8 *S. bigeminatum* Nees and No. 9 *S. laeve* Dunal, but I can find no difference that would warrant the separation. The earliest described species was *S. laeve* Dunal; Solan. Syn. 22 (1816), afterwards transferred by him in DC. Prodr. xiii. 1, 408 to *Bassovia* ? *laevis* Dunal. Trimen in Fl. Ceyl. iii. 231 included both the species of the F.B.I. under *S. laeve* Dunal and I think he was right because, even in the F.B.I., Clarke allowed that the calyx of *S. bigeminatum* might be "entire or obscurely toothed". Trimen considers the *S. denticulatum* Bl., No. 10 of F.B.I., to be a variety of *S. laeve*, but it seems to me to be easily distinguished, certainly in the Herbarium. Trimen's Plate is not a good picture of an average *S. laeve* !

Part VI.—LENTIBULARIACEAE.

Page 978 *Utricularia*. I should have found this genus extremely difficult if the whole of the Indian specimens at Kew had not been recently arranged by Dr. Stapf and identified with the sheets of the Vahl collection lent by the authorities at Copenhagen and with those of the type collection of Wight's Herbarium lent by the authorities at Glasgow. I have followed Dr. Stapf's arrangement as closely as possible and have named

the Calcutta and Madras specimens accordingly, also those of the Edinburgh Herbarium so kindly lent by Prof. Wright Smith. It is much to be hoped that Indian collectors will disentangle their specimens carefully in future so that the characters of the leaves and the little bladders may be recorded and if possible carefully drawn. Very few of the sheets of the collections dealt with had any notes on these points, and even notes of the colours of the flowers were almost invariably wanting.

GESNERIACEAE.

Page 984 *Æschynanthus*. I have adhered to the better-known generic name, though *Trichosporum* D.Don is older and has been adopted in the "Natürlichen Pflanzenfamilien." In the new Volume CXLVIII. of the Botanical Magazine, Dr. Stapf in Plate 8938 has retained *Æschynanthus* and it seems quite likely that, if the list of "nomina conservanda" is revised, it will be included in it. I have made two species of the S. Indian material with some doubt, for I think that Dr. Cooke in the Bombay Flora may have been right in considering that there was only one species in S. and W. India and Ceylon, *Æ. Perrottetii* A. DC. including *Æ. ceylanica* Gardn.

Page 985 *Didymocarpus*.—I have followed other writers of local Indian Floras in keeping up this genus instead of combining it, as is done in the "Pflanzenfamilien", with *Chirita* and others in a genus *Rottlera*. The identification of the species found in S. India for the most part depends on that of *D. Rottleriana* Wall., the type of which is in the Wallich Herbarium under No. 778. It is rather confusing that in the Fl. Br. Ind. C.B. Clarke maintained *D. tomentosa* Wt. as a separate species while in the "Monographiae Phanerogamarum, Vol. v." he makes it a variety of *D. Rottleriana*. In my opinion it is a species distinct not only morphologically, but also geographically, and I have kept it so and I have also kept distinct, as I think they are, *D. lanuginosa* and *D. Wightii*. As in many other similar difficult genera, the absence of notes on colour of flower, habitat, elevation of locality, etc., is a great hindrance to work on them, and for the S. Indian species there is an absence of good drawings such as are available for those of N. India.

BIGNONIACEAE.

Page 997 *Stereospermum*. I have followed Mr. Haines (*Kew Bull.*, 1922, p. 121, and "Botany of Bihar and Orissa", p. 655) in changing the name usually given to the tree known as *S. chelonoides* to *S. tetragonum* DC. I have seen no specimens that can be identified completely with the *Bignonia chelonoides* of the Linnean Herbarium as investigated by Mr. Haines. It is supposed to have been collected at Tranquebar by Koenig, but Tranquebar is not near any forests, I think, in which it is likely to have been found, and I doubt if it really came from the Madras Presidency area.

ACANTHACEAE.

Page 1010 *Nelsonia.* Lindau in the "Natürlichen Pflanzenfamilien" gives *N. brunelloides* O. Kze. as the oldest name for the plant usually known as *N. campestris* R. Br. I have, however, thought it better to follow Dr. Cooke and retain the name *N. campestris.* The picture by Lindau does not seem to me to represent the Indian plant, especially as regards the length of the spikes, the size of the leaves, the anthers and, above all, the seeds.

Page 1021 *Micranthus.* I followed Dr. Cooke and Mr. Haines in adopting this generic name, having overlooked the fact that *Phaylopsis* had been admitted as a "nomen conservandum."

Page 1023 *Eranthemum.* I have followed the "Natürlichen Pflanzenfamilien" in reverting to this name instead of describing the genus as *Daedalacanthus*, as has been done in the Fl. Br. Ind. followed by other Indian authors. The whole question was clearly explained by Dr. Stapf in 1909 in the letterpress to Bot. Mag. t. 8239 (*E. Wattii* Stapf). The plant on which Linnaeus described the genus is explained to have been a Ceylon one, which by some confusion he called *E. capense.* It is the *E. montanum* of Roxb. (*Daedalacanthus montanus* T. And.; F.B.I. iv. 421). I have thought it best to adhere to the later specific name, that of *capense* being so inappropriate. The plants referred in the Fl. Br. Ind. to *Eranthemum* will now come under the generic name of PSEUDERANTHEMUM Radlk.

Page 1025 *Strobilanthes.* This large and very interesting genus was subdivided by Mr. C. B. Clarke in the "Malay Materials" and elsewhere into several genera characterised chiefly by the pollen grains. As an old Indian field worker I felt that the use of these characters would be most difficult for botanical investigators, who can only very rarely have with them the necessary appliances for their study, and I am sure that they will take as a kindness that I have endeavoured in my analyses and descriptions to avoid the difficulty, and have adhered to the arrangement of the genus followed in the "Flora of British India." It is a remarkable thing that nearly all the 46 species which I have admitted are endemic to the Madras and Bombay Presidencies. One species only, *S. jeyporensis*, is given by Mr. Haines as occurring in the Bihar and Orissa region to the north, though it is quite likely that the North Indian *S. auriculatus* may also come down to the Ganjam forests, where I think I have seen it, though I have seen no specimens collected by anybody. Nine species are common to both Madras and Bombay. As is well known, most of the species of the genus flower, and then usually gregariously, only at long intervals, and I have indicated, as briefly as I could, the chief recorded flowering years. For most of the species, however,

many flowering years must have passed by without any collection of specimens being made, and this is unfortunate.

Page 1062 *Asystasia*. It has been by no means easy to deal with the specimens of this genus, for they dry very badly, and good notes on colour, elevation of locality, climate, etc., are very conspicuously wanting. Practically, however, the species arrange themselves fairly well geographically. All the same, *A. chelonoides* var. *quadrangularis* is not easily distinguished from the common usually coast species *A. gangetica* on the one hand and the rain-belt species *A. violacea* on the other.

Page 1075 *Justicia*. The arrangement and analysis of the species of Sect. 6 *Rostellularia* has been as difficult for me as it has been for previous workers. C. B. Clarke in the Fl. Br. India mentions that by Dr. T. Anderson they were "collected under 3 or 4 ill-defined species," and that consequently he was himself obliged "to arrange them in more species or reduce them to vars. of one." Actually, out of the S. Indian material he has admitted 6 species, but in most of them he has made several varieties. The large series of specimens which I have been lent for my use from various Herbaria has allowed me to arrange the species and varieties somewhat differently, and I have thought it well to revert to the opinions of Nees and other previous writers and to treat some of the varieties as species. I cannot say that I am quite fully satisfied with the result, but I think that my arrangement brings better together the shrubby ones as distinct from the herbaceous and the high-level ones as distinct from those which are found only in the plains. The characters afforded by the comparative size of the bracts, bracteoles and calyx-lobes are not always quite reliable, nor are those given by the presence or absence of pectinate hairs on and the scabrousness of those organs.

XXVI.—MISCELLANEOUS NOTES.

Captain N. G. Ball.—We learn that Captain N. G. Ball, M.A., Assistant to the Professor of Botany, Trinity College, Dublin has been appointed by the Secretary of State for the Colonies Professor of Botany and Director of Biological Laboratories, University College, Ceylon.

Lieut. A. J. Wakefield, B.Sc., has been appointed by the Secretary of State for the Colonies District Agricultural Officer, Tanganyika Territory.

Professor J. E. B. Warming.—It is with great regret that we learn of the death of Professor Johannes Eugen Bülow Warming on April 2nd at Copenhagen, in his 83rd year. Warming was Professor of Botany and Director of the Botanic Gardens at the University of Copenhagen from November, 1885, to December, 1911, being succeeded by C. Raunkiaer,

who in turn has been succeeded by C. H. Osterfeld. For over half a century Professor Warming has been a contributor to our knowledge of plants, and most of his work is of a high standard of scientific merit. His phytogeographical and taxonomic studies are well known, but it is in connection with the younger subject of ecology that his name will be most remembered. His "Oecology of Plants" (English translation by Percy Groom and I. B. Balfour, Oxford, 1909) originally appeared in 1895 under the title "Plantesamfund", based upon lectures delivered to his students in the University of Copenhagen. Few botanical works of recent years have had a wider influence. The latest edition, under the title "Pflanzengeographie," by Warming and P. Graebner, appeared in 1918. He also published important works on the vegetation of Brazil (Lagoa Santa), Greenland, the Faeroes, and Denmark.

Professor Warming was a valued correspondent of Kew for over forty years, and visited the Herbarium many times during 1908 when he attended the Darwin-Wallace celebrations of the Linnean Society.

Strychnos cinnamomifolia *Thwaites* var. **Wightii** *A. W. Hill.*—Seeds were recently sent to Kew by Mr. F. Bourdillon, late of the Indian Forest Service; they were collected in Travancore by the Conservator of Forests. An analysis, kindly undertaken by Prof. Henry Greenish of the Pharmaceutical Society, is supplementary to that published in the *Kew Bull.*, 1917, p. 195, when the seeds were found to contain 2·07 per cent. of Brucine and a very small percentage of Strychnine. The analysis of the Travancore seeds also shows Brucine to be in the greater proportion (2·231 per cent.), while Strychnine occurs in only the comparatively small quantity of 0·342 per cent. It is probable that these seeds belong to the var. *Wightii* A. W. Hill, while the former, supplied by Mr. T. Petch from Ceylon (*K.B.* 1917, p. 194), are those of the type. In the seeds of "Nux-vomica" (*Strychnos Nux-vomica* Linn.), which is confined in a wild state to India and Ceylon and is the most important official source of Strychnine, the total alkaloids have been found to vary considerably, averaging about 2·5 or 3 per cent. But the value as a medicinal standard of the total alkaloids may be somewhat nullified by the variation in the proportion of Strychnine to Brucine. A favourable yield of the more valuable alkaloid Strychnine is 1·25 per cent., and the total alkaloids as shown above for the seeds of *S. cinnamomifolia* var. *Wightii* amounts to 2·573.

The type species native of Ceylon and the variety found in Southern India and Assam are both large climbers. (See *Kew Bull.*, 1917, pp. 194–196.)

J. H. H.

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